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An Address

ON

INTESTINAL DISEASES*

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ONE of the relatively unexplored fields in medicine is the intestinal tract. A hundred articles will be written on the stomach to one on the intestines, and yet the normal and pathological physiology of the stomach is of crystalline simplicity compared with the complexity of the intestinal processes in health and in disease. Many test meals will be taken—often fractional test meals with their curves and charts and graphs so alluring to the medical mind—and yet, with the possible exception of the achylas, of no greater help in diagnosis than the ordinary Ewald test meal, while the study of the stool with its message as to intestinal function, intestinal bleeding, parasites, ulcerations and bacteriology is practically neglected.

Why is this so; why is this field so neglected? The anatomists have told us of the gross and finer structure, the glands in its wall, and its vascular and lymphatic supply. The physiologists have taught us its motor and secretory functions, its ferments and pro-ferments, its assimilative and absorptive processes. But in diagnosing variations from this normal, in determining whether we are dealing with changes in structure or in function, in evaluating motor and secretory abnormalities, in estimating the significance of changes in bacterial flora, in interpreting subjective symptoms, the difficulties are so great, the reading of the relatively meagre findings so confusing, that, except in the hands of

a few, the intestinal tract and its diseases, with the exception of its gross and obvious abnormalities, is regarded as a region of mystery. Many physicians, therefore, are satisfied with the obviously unsatisfactory diagnosis of diarrhoea or constipation, intestinal neurosis, or dyspepsia, or flatulence, without making much of an attempt to determine the underlying cause of these variations from the normal, and apparently not realizing at all that they are symptoms only, the successful treatment of which can only be brought about by a determination of their underlying cause or causes, and their correction if possible.

It is true we are sadly limited in our diagnostic data. We may study duodenal contents at one end, and rectal stools at the other, but, in this most complex of the body's laboratories, much that takes place will mirror itself but little in either of these two. We do learn something, however, from the presence or absence of occult blood in the stool, changes in its flora, its reaction, its shape, size and colour, its hetero- or homo-geneity; while the digital rectal examination, sigmoidoscopic and proctoscopic study, radiography and especially fluoroscopy, with barium given both by mouth and by enema, have added immensely to our knowledge of the shape, size and position of the large bowel, as well as its gross and in some cases even its finer morphological abnormalities.

From the history of the case, too, if well taken and properly interpreted, we can learn

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much, although we must never forget the frequency with which intestinal symptoms are due to disease elsewhere and *vice versa*. Here a central pneumonia, or pleurisy, or measles or typhoid fever, presenting the almost classical symptoms of acute appendicitis; here a pyelitis, or ureteral calculus, or salpingitis, or ovarian cyst with twisted pedicle presenting a similar picture—calling attention, if it is needed, to the importance of a thorough general physical examination, as well as a pelvic examination, and study of blood and urine in all cases, whatever their symptoms; here we have an intestinal neoplasm with only gastric symptoms; here, a cancer of the stomach with symptoms entirely intestinal—and through it all, the immense variation in the symptom-response of the patient to disease processes, due partly to variation in the psyche, partly to local reactivity to stimuli. We have seen many cases in psychasthenic individuals where a small adhesion between liver and duodenum, or between two loops of intestines, produced far more pain or disturbance in function than a deep callous ulcer or a large neoplasm in an apathetic person.

It is the protean nature of the symptoms presented, the many factors that must be considered before even a tentative diagnosis can be made, and the great difficulties in collecting diagnostic data that make the field so fascinating and yet fruitful for him who cares to delve, for it is almost untilled soil.

In our interpretation of intestinal symptoms, we have been greatly aided by a conception, which, while not absolutely correct either anatomically or physiologically, has nevertheless proved immensely helpful—that the intestinal tract is poised between two opposing forces, the one vagal, the other sympathetic in origin, the one stimulating to tone, peristalsis and secretion, the other inhibitory; that normal balance between these two spells health, and that unbalance, with the preponderance of the one or the other, (vago-tonia with its increased tonus, peristalsis and secretion; sympathico-tonia with its sluggishness and atony), spells dysfunction, discomfort, disease.

While it is obviously impossible to cover the whole field of intestinal pathology in such a short time, I shall try to touch upon, if only briefly, a considerable number of problems in this field which have seemed to me in the course

of my work to have been of special interest,—certain of the less well known factors in the production of diarrhoea and constipation; the so-called intestinal autotoxæmia; chronic appendicitis; tuberculosis and new growths of the intestines; and the various forms of colitis, catarrhal, mucous and ulcerative.

DIARRHŒA

Acute diarrhoea is of course a symptom, not a disease, and when as usually happens it represents irritation by food, or drug or bacteria or toxins, or is one of the somatic signs of psychic disturbance, the cause is usually easy to determine and the treatment as a rule effective. But certain of the chronic diarrhoeas are much harder to interpret properly.

1. *The Gastrogenous Diarrhoeas*.—Those of purely gastric origin are peculiarly interesting. Of course gastric achylia or achlorhydria, by the ordinary test meal, is very common; more than 95 per cent of cases are benign; very few are due to cancer or pernicious anæmia; most are associated with a normal or sluggish bowel action. But there is one group where diarrhoea, intractable under the usual treatment, usually of the morning type, is the rule, and, as I see it, falling into two sub-groups; one where it follows sudden emotional shock or long nervous strain—purely psychogenic in origin and probably due to vagal block with inhibition of gastric secretion; the other met with mostly in old people, with deficient or defective teeth, where the process represents a true achylic gastritis—partly mechanical, partly infectious and partly senile in origin. In both groups, however, there are no gastric, only intestinal, symptoms, and in each there is almost immediate cure with small doses of dilute hydrochloric acid, ten drops before, fifteen drops after meals; the smallness of the dose required rather suggests that these cases represent some complicated disturbance of motor mechanism in addition to the absence of the disinfective and pylorus-closing effect of the normal gastric acid.

2. *Pancreatogenous*.—We have made a careful quantitative estimation of the pancreatic ferments in these cases, as also in pernicious anæmia, and there is no diminution of these ferments, showing that this form of diarrhoea is purely gastrogenous, but there is a definite group of pancreatogenous diarrhoeas, the most

striking example of which is found in certain cases of *tropical sprue*, where we find a complete absence of pancreatic secretion, and where pancreatic extract and calcium salts are as effective in treatment as parathyroid extract in other cases.

Another diarrhoea of pancreatic origin is met with in a few cases of gall-bladder disease and occasionally after cholecystectomy, when a functional pancreatic achylia can be demonstrated and when pancreatin again is helpful, while in a third group—the senile group—studies of stool and duodenal contents show not a complete absence but a marked diminution of ferment. In certain of the intestinal dyspepsias of the old, of the undernourished or of the chronically ill, it is quite worth while to try pancreatin therapy.

Of course the findings in sprue are of peculiar interest, because, as it presents a blood picture identical with that in pernicious anaemia, it furnishes in a sense, an argument in favour of the intestinal origin of that disease, a view supported by Faber and Hurst who regard certain streptococci, just as others regard the *B. Welchii*, as the primary cause of the disease. It is, incidentally, rather interesting to remember that long before the brilliant work of Campbell Howard and George Minot on the treatment of pernicious anaemia with liver, liver soup was used for the treatment of the anaemia of sprue by Patrick Manson, and he in turn was supposed to have obtained the idea from the natives of Ceylon where it has apparently been used in the treatment of sprue for many years.

3. *Fermentative Dyspepsia*.—Another small group is that of fermentative intestinal dyspepsia, first described by Schmidt, with its large, soft, yellow, acid stool, with much gas, and with microscopic evidence of marked deficiency in starch digestion. In these a cure is quickly obtained with a starch-low diet and diastase.

4. *Endocrine, etc.*—It is well to remember that in a small proportion of cases of hyperthyroidism, intractable diarrhoea may be an early, sometimes the first, symptom and it is always well to keep this possibility in mind in cases of supposedly nervous diarrhoea, and to make basal-metabolic readings. Another small but equally interesting group is that where the diarrhoea represents the motor equivalent, as it were, of the colonic crisis of locomotor ataxia.

CONSTIPATION

The vast majority of cases of chronic constipation have no organic basis, represent careless habits of eating and living, and can be corrected by diet, exercise, and the installation of the habit of regular defaecation, if the doctor be wise and persistent and the patient co-operative and understanding. A cold bath, a morning dose of salt and water, or if preferred a fruit juice mixture, a bran cereal, bran or whole wheat bread, fruits and greens in abundance, prunes or grapes or an apple at night, exercise and exercises, a regular habit, re-education of the patient's mental attitude, with the casting out of that devil of devils, fear of so-called auto-intoxication, and the abolition of that most pernicious of treatments, high colonic irrigations, will cure a most surprising number of intractable cases if the patient has faith in his doctor, and the doctor has faith in his method. Even in that large group where visceroptosis and abdominal and intestinal atony play a rôle (the ptosis of course being of no significance except that it predisposes to atony) brilliant results can also be obtained if we combine with the treatment above measures to increase abdominal fat and improve abdominal tone, posture, abdominal and respiratory exercises, massage and forced feeding.

1. *Dyschesia*.—But there are certain cases of constipation, not so purely functional or dietetic in origin, in which such treatment alone is not efficacious. One of these is rectal constipation—*dyschesia*—when the sole cause is a lowered sensitiveness of the rectal mucosa to mechanical stimulation; perhaps it is congenital, perhaps the end result of a long constipation or persistent failure to respond to the urge to defaecation. These cases are easy to diagnose by digital rectal examination and x-ray study, but in their therapy, for a time at least, we have to combine with the treatment above certain other measures—a small oil instillation of two to three ounces, or a small hot water enema of one-half pint of water at 104° to 110° F.

2. *Endocrine*.—A rather unusual type of constipation is that met with in women in the menopausal or premenopausal period—women often fair, nearly always fat and usually in the forties—when the underlying cause is a true though usually unrecognized hypothyroidism,

a *forme fruste* of myxoedema. In the last few years we have studied 156 cases which might fall into this group, usually those women with sluggish bowels and often intractable constipation, and of these 82, or 52 per cent, gave readings of less than minus 10 per cent, and 32, or 20 per cent, less than minus 20 per cent. Obviously, the treatment par excellence in this form of constipation is the administration of thyroid extract, and I have seen few more brilliant results than those obtained by this therapy in certain of these cases.

3. *Chronic Appendicitis*.—Another form of constipation is that due to chronic appendicitis. What is chronic appendicitis? Many surgeons deny its presence; others insist that it is only justifiably used when there have been definite acute attacks, and in the main, but not altogether, I agree with this in principle. For I feel that in the vast majority of such so-called chronic appendicitides the case is in reality a low-grade inflammatory process, involving terminal ileum, cæcum and ascending colon as well as appendix, a perityphlitis if you will, usually found in visceroptotics with chronic constipation, when operative treatment usually does irreparable damage, adding post-operative to pre-operative adhesions and making the second state of that man or, much oftener, woman, far worse than the first. But I am sure that there is a true chronic or subacute appendicitis, where the most careful analysis of history or examination of patient fails to incriminate the appendix and yet when there is definite localized appendiceal disease. As I find it, these cases have constant, or much more frequently, periodic gastric discomfort, often almost typical of duodenal ulcer; sometimes even slight hæmatemesis or melæna, suggesting an associated duodenitis or duodenal erosion; they are almost always constipated, with symptoms that do *not* yield to treatment based on the assumption that the disease is duodenal or purely functional in origin. In the diagnosis of these cases, we have been most helped by repeated fluoroscopic studies, showing an appendix, often long, segmented, kinked, often sensitive to palpation, often very slow in emptying, even after large purgative doses of magnesium sulphate. Often the blood shows a slight leucocytosis, 9,000 to 12,000, sometimes definitely increased by deep palpation and by exercise. We have an ever-increasing group of

such cases where surgery has been followed by complete relief of symptoms and where the pathologist has reported a marked chronic inflammation in the removed appendix, and where without these criteria we could not have made the correct diagnosis.

Of course a visualized appendix after barium administration is not necessarily diseased, but if it is kinked or segmented or adherent or bulbous, if it remains filled for several days even after active purgatives, and if it is persistently tender on deep palpation under the fluoroscope, it is in all probability pathological.

ABDOMINAL ADHESIONS

The treatment of abdominal adhesions, usually post-operative or post-inflammatory, is always unsatisfactory. There is far too great a tendency towards immediate surgical interference, and we who see these cases later know how often this is unsuccessful. It is well first to try to correct the stasis caused by the adhesions by a smooth laxative diet, local heat, mineral oil or oil by rectum, belladonna, and later massage and exercise, and it is surprising by this means how many cases we can make better, or even symptom-free and clinically well. When in doubt in regard to these cases or in fact any cases with sub-acute or chronic abdominal symptoms, especially pain, see what rest, mental as well as physical, can do before advising surgery. The margin that separates normal function and health from dysfunction with its spasm, hypertonus and consequent pain is a very narrow one. Rest, if properly used and persisted in, may swing the balance in the right direction and keep it there.

AUTO-INTOXICATION: INTESTINAL TOXÆMIA

Closely related to chronic constipation and intestinal stasis is the question of auto-intoxication; a much abused term, for in probably not 1 per cent of the cases in which the condition is blamed for the patient's symptoms is there a scintilla of evidence that such is the case. The popular viewpoint is singularly unfortunate, in that it not only discourages further and probably enlightening studies as to the true cause of the condition, with inauguration of a rational therapy—oftenest psychotherapy—but it has given rise to pernicious therapy, absurd dietetic restrictions, and repeated colonic irrigations

with huge amounts of fluid. Those who advocate the latter do not realize in the first place that this daily distension of the gut must lead to dilatation, atony and increasing difficulty in normal elimination; and, in the second place, that if the absorption of toxins does play a rôle it is infinitely more likely to occur from the liquid faeces of an irrigation than from the most stubbornly constipated stool.

And yet, while we realize that we are treading on dangerous and debatable ground when we speak of such toxic symptoms, in a few—a very few—cases it is the *only* possible explanation. But whether it is due to a toxin normally present but in excess, or to an exogenous toxin; whether it is due to the insufficiency of the protective mechanism—intestinal mucosa, liver, thyroid, and to whatever rôle proteolytic Gram-positive anaerobes play; these questions cannot be answered. But that some cases are due to a toxicosis of intestinal origin, with insufficiency of the protective antitoxic mechanism, seems definitely proved.

Eppinger and Guttman isolated ptomaines from the stool of two patients, histamin in one case, beta-amido-azolyl-ester in the other; and reproduced the symptoms, asthma in one case, urticaria in the other, by their injection. The fact that the poisons cannot often be demonstrated is not so much a proof of their absence as of their extreme complexity and of the minimal amounts in which they must be present.

We have been most interested in a small group of cases of eczema, urticaria and erythema where intestinal toxins seemed to have been the cause. They gave marked reaction to the intradermal injection of certain proteins. The skin lesions cleared up quickly with the withdrawal of these foods from the diet, while in all our cases a marked increase in resistance was brought about by subsequently giving these foods in gradually increasing amounts. On the other hand, barring these few cases with local skin lesions, we have found skin sensitization tests of no value whatsoever.

In certain cases, however, we seem to be dealing more probably with a bacteriæmia than a toxæmia, as for example, in two cases of severe recurring attacks of choroiditis, the attacks in each case being preceded by violent digestive symptoms, nausea, vomiting, fever, and change in the stool from normal acidity with colon bacilli

predominating to intensely alkaline with a preponderance of Gram-positive micro-organisms. In one of these cases cure was obtained after all medical and dietetic measures had proved unavailing by an appendicostomy and *ipso facto* the transference of the colon from an anaerobic to an aerobic medium; in the other by a resection of the dilated, atonic and definitely diseased cæcum and ascending colon.

Another type of toxæmia of intestinal origin, in which the liver also seems to play a large rôle, is met with in certain cases of migraine and bilious headache, for whatever the primary cause of migraine, probably some congenital defect or functional anomaly, there must be a secondary factor which applies the spark as it were and brings on the attack. Very careful clinical studies, supplemented by many sugar tolerance tests, have convinced us that in a not inconsiderable number of these such a secondary factor is the inability of the organism to take proper care of the sugars, either in the intestine or more probably in the liver, as in many of these cases there is a marked swelling of the liver coincidental with the headache, nausea and vomiting. We get very marked improvement and sometimes clinical cure by keeping these patients for a considerable time on a sugar-free, starch-low diet, and we have had really brilliant results with more than fifty such cases. In our experience this is a much more likely cause than purin-rich foods, or excess of animal protein food; while, as regards the latter, we have been singularly disappointed by Widal's hæmo-elasic test, though helped in the treatment of the small group where protein poisoning seems to be the cause by his suggestion of giving peptone before meals in the hope of producing a transient immunity.

TUBERCULOSIS

* We meet tuberculosis of the intestinal tract in two main forms. First, an extensive ulcerative process involving the small and large gut, present in from 85 to 95 per cent of all cases dying of pulmonary tuberculosis, usually though not always a terminal phenomenon, relatively rarely diagnosed, though often suspected by the increase of the intestinal symptoms (especially diarrhœa) the more septic type of fever, and the more rapid downward course of the patient. Obviously in most cases this form is hardly sus-

ceptible to treatment, although in some cases the quartz lamp and calcium chloride intravenously seem to relieve the process. Second, a localized very slowly progressive process, with extensive fibrous-tissue formation, presumably due to an attenuated virus, especially likely to involve the cæcum, often mistaken for a neoplasm, suggested but not proved by an x-ray picture, incidentally met with in any non-obstructing ulcerating tumour, and only suggestive of tuberculosis in the presence of evidence of that disease elsewhere. This is now treated far more successfully by the Alpine lamp than formerly by surgical resection.

INTESTINAL NEOPLASMS

It is a surprising fact that in the vast majority of cases of neoplasm of the intestine an early diagnosis is rarely made, and even a late correct diagnosis is made with shocking infrequency. In a series of nine consecutive cases, for instance, which we saw within a period of a few months—cases with symptoms lasting from six to eighteen months—in not one had the correct diagnosis been made. They had been diagnosed and treated as cases of chronic constipation, mucous colitis, nervous intestinal indigestion, intestinal cramp and colic, and even gastric dyspepsia; the last peculiarly interesting because just as we have in rare instances gastric cancer with only intestinal symptoms, so in certain cases, the reverse may be true, and nausea, vomiting, pyloric obstructive symptoms, and even hæmatemesis, may be the only symptoms of a cancer of sigmoid or colon. The main reason for our failure to make early or even late correct diagnosis of intestinal growths is our failure to suspect their presence; for when we remember that in only 5 per cent of the cases is the growth present in that portion of the gut obviously inaccessible to careful methods of study—the small intestine—while the other 95 per cent of the cases are in the large bowel—80 per cent in the rectum, 15 per cent in cæcum, colon and sigmoid, in the examination of which easy diagnostic methods are ours for the asking, we cannot fail to realize how much earlier and much oftener these cases should be recognized. Digital rectal examination, sigmoidoscopic study, test of the stool for occult blood on a meat-free diet, careful abdominal palpation, in a hot bath if the walls

are rigid, careful x-ray study, especially fluoroscopy with the barium enema—these methods, all so simple, will give us usually our diagnosis, but are rarely used in the early stages of the disease because the condition is not suspected.

I know of no better rule than this. In all cases, but especially in the middle-aged and old, always suspect the possibility of malignancy in everyone whose intestinal habit shows a change without cause; constipation of progressive type; diarrhœa, (often a false diarrhœa); alternating constipation and diarrhœa; attacks of colic or cramp which are often the earliest signs of beginning obstruction. Any symptoms which appear *de novo* and which do not yield to simple symptomatic treatment should arouse our suspicion and should make us utilize the simple methods of study mentioned above.

Surgery is the only cure, and to give surgery a fair chance of success, early diagnosis is important. But to make an early diagnosis, suspicion, *early* suspicion, as regards the significance of symptoms, often mild or banal, frequently transitory, usually regarded as of little importance and yet in reality our first warning, is essential. Remember that here, as elsewhere in the abdominal cavity, early symptoms are in the main due to associated functional disturbances, especially in the motor sphere, rather than to the organic lesion itself, and our great desideratum is to make such a diagnosis before the growth has become large, and before extension or metastasis has occurred. It is really relatively easy to do this in this group of cases, for as a rule growth is slow and metastasis is late. Early diagnosis and probable surgical cure is ours for the asking if we be not blind.

COLITIS

Broadly speaking, colitis is any form of inflammation of the colon, including of course cæcum, sigmoid and rectum. Its main diagnostic sign is the presence of mucus, or in addition, pus and blood in the stool. While easy to diagnose in its severer forms, it is extremely hard to recognize in its milder types. Some see colitis in the slightest abnormality of colonic function, others only admit its presence when the pathological changes are deep seated and obvious. Some think true colitis is very rare, others that it is the commonest cause of

ill health. Just as it is difficult to say where functional gastric dyspepsia ends and mild gastritis begins, so here it is equally difficult to determine whether the symptoms are purely functional in origin or whether they have to some extent at least an organic basis. Colons vary so markedly in their response to stimuli and in their power of resistance to various traumata—food, drugs, cold, bacteria—that there must always be a borderline group of cases which some will call functional and treat by psychotherapy, and others organic, and treat by diet and drugs.

We may divide colitis in many ways—into acute and chronic forms, catarrhal or ulcerative, diffuse or localized. Many of the cases due to food or drugs are likely to be diffuse, while the tuberculous, amœbic, and non-specific ulcerative types are much more likely to be localized. We have already touched upon certain forms of colitis when discussing diarrhoea and constipation, such as those due to gastric or pancreatic achylia, and to sprue. The majority of the milder cases—and I believe the disease in its milder form is much more prevalent than is usually supposed—are caused by abuse of food, condiments, or drugs, especially purgatives, and can usually be improved or even cured by a proper diet and the elimination of purgative drugs. A smooth laxative diet should be followed, sometimes for a period a lacto-vegetarian or lacto-ovo-vegetarian diet.

A very interesting group is that following gastric operations, especially that most unphysiological one, gastro-enterostomy, where, unless the greatest post-operative dietetic care is taken, a chronic entero-colitis will develop. Surgeons forget that the functional disturbances associated with all gastro-intestinal organic diseases persist long after the removal of their organic cause, and many potential successes are converted into partial or complete failures because of a lack of realization of this. Would it not be wise perhaps in this type of case to have a clinician, rather than a surgeon, to direct the post-operative and convalescent period?

Mucous Colitis.—Mucous colitis may begin as a pure psychoneurosis and be purely psychogenic, or may represent the late stages of a colitis of purely physical origin, drugs, foods, infection. The former is by far the more

common cause, but when of long duration, there are usually some, albeit slight, evidences of inflammatory change as well. Its seat of election is the terminal colon and sigmoid, but when it affects the cæcum and hepatic flexure, it is often diagnosed as subacute appendicitis or cholecystitis, usually followed by the surgical removal of those probably quite inoffensive viscera, with as its almost inevitable sequel absolutely no improvement, often quite the reverse as regards the colitis. It is a wise rule always to ponder a long time before advising surgery in chronic abdominal conditions, for its brilliant success in the acute abdomen blinds us to its many failures—especially late failures—if employed for chronic disease.

In planning the treatment of mucous colitis, we shall, as a rule, not be successful if we do not recognize both the psychogenic and the physical factors in the case. As regards the former, psychotherapy, re-education, lessening nervous strain and mental fatigue, elimination of depressing and irritant factors, should all be considered; while as to the physical treatment we should institute a smooth diet, (notwithstanding von Noorden to the contrary), often additional calories by the use of milk, butter-milk, acidophilus milk, raw eggs, cream or preparations of lactose and dextrin, and, as most of these cases are constipated, mineral oil by mouth. Of extreme value are instillations into the rectum of small doses, two to four ounces, of olive or cottonseed oil, with small doses, five to fifteen drops, of castor oil by mouth after meals. In addition to this, as our drug par excellence, atropin or belladonna in maximal doses, for certain of these cases represent a true vagotonia, requiring enormous doses of this drug before an approximation of normal vagal-sympathetic balance is restored.

Ulcerative Colitis.—Of much greater severity and at least its equal in chronicity is the other type of colitis—ulcerative colitis, with pus and usually blood in the stool in addition to mucus. It is sometimes diffuse; it is far oftener localized, especially in the cæcum, or sigmoid and rectum. We meet with it in rare instances as an expression of a true toxæmia—endogenous as in uræmia and possibly pellagra; exogenous in certain cases after the use of arsenic, arsphenamin or mercury, a number of cases having been reported after the use of mercurochrome.

Ulcerative Colitis.—With the exception of the very occasional rectal ulcerations of gonorrhœal or luetic origin, the cases of ulcerative colitis may be divided into four groups.

1. The tuberculous forms—almost constant in the terminal stages of pulmonary tuberculosis, of which we have already spoken.

2. The ulcerative colitis associated with malignant disease of the colon, due partly to invasion, partly to toxæmia, partly to disturbance of blood supply and partly to obstruction by, and necrosis of, the growth. This often plays the major rôle in the intestinal symptoms presented, especially the very confusing false diarrhœa which is in reality an expression of chronic constipation and progressive obstruction.

3. The true dysenteric colitis, bacillary or amœbic. The former, the Shiga-Flexner-Hiss bacillary type, is of peculiar interest, because of the view of Hurst and others that many of the supposedly non-specific ulcerative cases—our fourth group—in reality are cases of bacillary dysentery, where the dysenteric bacilli have been so overgrown by other and hardier micro-organisms, especially colon bacilli and streptococci, that they are no longer found in the stool. For this reason Hurst treats, and he claims successfully, all his cases of the so-called idiopathic group with a polyvalent anti-dysenteric serum. In our experience, however, serological tests are negative and the success of this treatment, if any, is we believe explicable on the basis of non-specific protein therapy. It is, however, a well known fact, as Shiga himself has pointed out, that it is only in the early stages of true bacillary dysentery that the bacilli are found with certainty and it is always wise to supplement stool study with serological tests.

In the amœbic form it is also very difficult in many cases to find amœbæ or cysts, and quite a few cases of supposedly non-specific type are found at autopsy to be of amœbic origin. It is not a bad rule in cases where there is any doubt to try first some anti-amœbic remedy, bismuth-emetin-iodide, yatren, stovarsol, or oil of chenopodium, before committing oneself to the non-specific nature of the disease. On the other hand, the failure to find amœbæ or cysts in the fæces, may be minimized by a far better technique of stool examination. Paulson and Andrews, the latter from the

School of Hygiene, working in my clinic, from a study of 253 patients taken at random, found protozoa—usually of course harmless—in 13.7 per cent in defæcated specimens, but in 46.3 per cent of specimens obtained through the sigmoidoscope and examined immediately; a finding that should make us realize that by the methods usually employed we are probably finding evidences of amœbiasis from stool study in only about one-quarter of the cases in which they are really present. To minimize this appalling error, I cannot too strongly recommend the method just described.

4. The last, and in many ways most interesting, form of ulcerative colitis is the so-called non-specific type, first described by Wilks at Guy's Hospital, antedating by thirty years the work of Albu of Berlin whose name is usually associated with the discovery of the disease.

Before discussing its etiology, it might be of interest to say a word about the bacteriology of the intestinal tract as it has a marked bearing on the case. In health the duodenum is practically sterile, but when the gastric fluid shows a lowered acidity, or an achylia, it has a large and varied flora, a reason incidentally why bacterial study of the duodenal contents by the Meltzer-Lyon method is of little or no value in the diagnosis of biliary tract infections, where the gastric juice usually shows low or no free acid. Harvey Cushing, Gilbert and Dominici showed many years ago that from the duodenum to the ileo-cæcal valve, there was a steady rise in viable bacteria, and from there a slow and gradual fall; and that in the terminal ileum there were many streptococci normally, while in the rectum and terminal colon, the colon bacillus predominated. This is the reason of course why the peritonitis of perforations high in the intestinal tract is likely to be streptococcal, but when the lower tract is involved the *B. coli* is the infecting agent.

Recently Paulson at my suggestion has been studying, both aerobically and anaerobically, the flora at various levels of the human intestinal tract, obtaining his specimens at operations where the gut has been opened at various levels.

His studies from the healthy ileum are most interesting, for he found that while, on change of diet or even on the same diet, the flora varied somewhat, nevertheless both in smears and in

plates, streptococci predominated as a rule; that the hydrogen ion concentration bears no relation to the type of flora; and that as far as the ileum is concerned, acidophilus milk and lactose do not change the flora as they are capable of doing in the large intestine. The findings are of peculiar interest in regard to ulcerative colitis. It is very likely that the various streptococci and diplococci found in such abundance in rectal stools and in rectal and sigmoid mucopus are not, as usually supposed, invading or foreign organisms, but are in reality forms normally present in the ileum but reaching the rectum in these cases because of the abnormal peristalsis of the large gut. Incidentally, the giving of violent purgatives in healthy individuals will usually bring about a marked increase of the streptococci and diplococci in the stool.

Idiopathic, non-specific, ulcerative colitis, colitis gravis, suppurative colitis, colitis ulcerosa, in our experience is relatively rare. Schmidt in 1912 had seen only thirty cases; McCallum finds it in only 5 of 1,000 autopsies; and in our clinic of more than 3,000 new cases yearly, we rarely see more than 6 to 10 cases in the year. But, *mirabile dictu*, the Mayo Clinic in 1923 reported 400 cases, although I feel sure that very many cases of simple proctitis or sigmoiditis are included in the series. It is a true clinical entity; it is usually met with in young adults; its onset may be acute or gradual; it is singularly liable to remission and exacerbations. We usually meet with it in two forms; that with much pus in the stool, many evidences of toxæmia or bacteriæmia, great loss of weight and strength, marked anæmia, myocardial changes, arthritis, and erythema nodosum; and that with very few systemic symptoms, a persistent, painless, intractable diarrhoea. In each group the relatively small amount of blood usually present may be replaced by extensive bleeding so that we may have a true hæmorrhagic type.

The sigmoidoscopic picture — hyperæmia, œdema, tendency to bleed, hæmorrhagic erosions, small ulcers, involvement of deep tissues—is very suggestive but not absolutely diagnostic.

In four-fifths of our cases, rectum and sigmoid were first involved, in one-fifth the cæcum and ascending colon. We have not been able to incriminate foci of infection elsewhere, though

the Mayo Clinic lays great stress on periapical abscesses, diseased tonsils, or infected accessory nasal sinuses as primary foci.

Bargen, of the Mayo Clinic, has described a diplococcus which he believes to be the causal agent, but we and many others have been absolutely unable to confirm this work and still feel that there is no proof that it is a specific infection. Paulson, of my clinic, from a very interesting study carried on over a period of two years, isolated from fourteen cases ten varieties of streptococci, including the diplococcus described by Bargen; and he found not only that lesions in rabbits similar to those described by Bargen with his organism could be produced by any one of five types of these cocci, but that other organisms, bacilli as well as cocci, from various sources, throat, uterus, etc., from individuals not suffering with ulcerative colitis, could produce similar lesions if injected intravenously. He and I feel that the bacterial etiology of ulcerative colitis is still undetermined, and that Bargen's vaccine is not specific. We have found that in all our cases in which it has been used, its effect was practically nil.

In the cases which vaccine therapy seems to help, the results can usually be explained by the effect of the general treatment alone, but in some cases we may have a non-specific protein reaction as well, which may be beneficial.

The treatment of non-specific ulcerative colitis is as diverse as it is disappointing; rest, general hygiene, fresh air and sunshine, a generous but low-residue diet, iron-arsenic hypodermics, or liver and Bland's pills for the anæmia, and time, in our experience, are more valuable than many of the so-called specific forms of treatment, such as iodine and kaolin by mouth (the latter however very helpful in controlling diarrhoea), irrigations of tannic acid (in our experience the most helpful), acriflavine, various silver preparations, hydrogen peroxide, gentian violet, potassium permanganate, yatren by mouth or rectum, stovarsol, anti-dysenteric serum, vaccine or bacteriophage. Some of the milder cases are cured by or in spite of treatment. Most of the severe cases come to surgery sooner or later—appendicostomy or cæcostomy, if you feel that intensive local treatment and the substitution of an aerobic for an anærobic medium is the great desideratum; ileostomy, colostomy or ileo-sigmoidostomy if rest for the diseased bowel is our

main object. In the fulminating cases, ileostomy is the only operation to be considered.

The prognosis is never good, be the treatment medical or surgical; remissions occur, the patient seems well, but the stool still shows a few pus cells and often a trace of blood, and exacerbations are common. We are still profoundly in the dark as to its real cause. Perhaps it represents the absence of some protective mechanism, or is a deficiency disease, rather than a specific infection.

CONCLUSIONS

In this short talk I have been unable for lack of time to touch at all upon certain intestinal conditions of which I should have liked to have spoken—atypical forms of acute appendicitis, diverticulosis and diverticulitis, megacolon and redundant sigmoid, acute and chronic intestinal obstruction, polyposis and its incidence in certain cases of ulcerative colitis, and diseases due to intestinal parasites—the last of peculiar interest, since we have shown that we shall find these parasites from three to four times as frequently if we examine fresh stool specimens obtained through the sigmoidoscope as by the usual method of stool examination. An ovum, an embryo, a parasite, a shower of Charcot-Leyden crystals, a number of eosinophile cells may be picked up often in this way and a puzzling case cleared up immediately. We have not even touched upon that common and yet most difficult of intestinal conditions—the bane

of every practitioner—intestinal flatulence, intestinal gas. In many cases we cannot tell its origin. Is it due to air swallowing, increased fermentation or putrefaction, diminished absorption, delayed motility, abnormal bacterial flora, secretory disturbance? These questions are as difficult to answer as the symptoms are hard to cure. As Hutchison aptly quotes: "The wind bloweth where it listeth and we hear the sound thereof, but cannot tell whence it cometh and whither it goeth."

I have, however, tried to touch upon certain intestinal problems which have been of peculiar interest to me: I have tried to show you that some hitherto obscure conditions have been cleared up by intensive clinical and laboratory studies, and that certain diseases, formerly intractable to treatment, have been helped or even cured by a proper conception of their origin and evolution. It is still in the main however a dark continent, a terra incognita where mysteries are performed, which, as yet, we may not understand. But new vistas are opening up, new avenues of attack and of research being discovered. It is no longer, as it was a few years ago, practically a virgin field, but it is still hardly beyond the primiparous stage, and offers a fertile field to those who are interested in its problems, and willing to undertake the laborious, frequently unæsthetic, and often disappointing, researches necessary to its fruitful cultivation.

Caudal Epidural Anæsthesia in Perineal Surgery of Genito-Urinary Tract.—In 165 consecutive perineal operations reported on by George Packer Berry, Baltimore, in which a single epidural injection of 20 c.c. of 3 per cent procaine hydrochloride solution was used as an anæsthetic agent, success, as measured by the complete abolition of pain, was present in 84 per cent, while in 16 per cent some additional anæsthetic was required. The series included 140 cases of perineal prostatectomy for benign hypertrophy; sixteen cases of conservative and three of radical perineal prostatectomy for carcinoma, and three cases of radical excision of the entire seminal tract for tuberculosis. The complete success of the anæsthetic in the three cases each of radical operation for carcinoma and radical excision of the seminal tract for tuberculosis shows the splendid possibilities of this simple method of anæsthesia. Serious reactions did not occur in the entire series and no reaction at all took place in 52 per cent of the cases. Symptoms characteristic of gen-

eralized procaine intoxication occurred in 10 per cent, the remaining cases showed symptoms secondary to visceral vascular dilatation from sympathetic nerve paralysis. The value of epinephrine in controlling this type of reaction was demonstrated. The many complications commonly seen in old men, especially derangements of the cardiovascular, respiratory and renal systems, do not contra-indicate the use of the epidural method. Its safety, when 20 c.c. of a 3 per cent solution is used, is shown by the absence of any serious reactions, while its value over other methods in the presence of these complications is self-evident. Furthermore, the previous injection of procaine does not in any way interfere with the subsequent administration of a general anæsthetic in case of failure. Attention is called to the great degree of relaxation of the perineal structures following epidural injections, a factor often indispensable when operations are performed in this field.—*J. Am. M. Ass.*, March 3, 1928.

An Address
ON
DIVERTICULOSIS OF THE URINARY BLADDER*

By E. J. BOARDMAN, M.D.,

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THE scope of this address is intended to cover only the problem of the diverticulum from the standpoint of its importance in surgery of the prostate. The question of its possible congenital etiology is barely raised, and the technique of its surgical obliteration omitted entirely. The ease with which it may be missed, and the unsatisfactory result commonly obtained in a prostatectomy conducted in the presence of an unrecognized or ignored diverticulum, is my reason for again calling the attention of this Society to the frequency with which diverticula and prostatic hypertrophy are associated.

While not asserting positively that the prostate is the cause of the diverticulum in every case, one must admit that the regularity with which it forms a part of the clinical picture in prostatic obstruction is too great to be explained as the coincident onset of a separate condition at that particular time of life. One authority¹ quotes 41 cases, of which 35 occurred after forty years of age. Of our own 18 cases, all were over fifty years, but this may be modified to some extent by the fact that we rarely see children under twelve, and that we have not included

those small, easily illuminated pockets in younger subjects, not infrequently observed during routine cystoscopy, which have no clinical significance at the time, but which the observer notes, with the inward reservation that they are potential diverticula should chronic obstruction supervene. Whatever the etiology, one who meets the condition with some degree of frequency cannot fail to observe its constant association with the development of obstruction, be the cause the prostate or otherwise.

With the development of urethral obstruction, no matter what the degree, begins also the effort to overcome; the latter keeping pace with the former until, with increasing impediment, the expulsive effort becomes more or less ineffectual, and may gradually lag behind to the point of inducing complete retention. Associated with the attempt to overcome resistance, there is always a definite hypertrophy of the musculature of the bladder wall, which may increase until it presents an intricate network of prominent ridges, separated by sulci of unequal proportions, some deep, some shallow, constituting what is commonly designated the trabeculated bladder. Since the trabeculations compose the musculature, and the sulci are deficient in, or even lack, muscle fibres, it is not surprising that, in the face of continuous and increasing pressure, these weaker places should deepen and occasionally form a pocket, which is to all intents and purposes a hernia through the bladder wall, whose neck is merely one of the spaces in the trabecular interlacement of muscle bands. Since the wall of this pouch consists almost entirely of vesical mucosa, what is more likely than that, other things being equal, and following the usual course of ruptures in other places, it should continue to increase in



FIG. 1.—Trabeculation of the urinary bladder.

* Read before the Winnipeg Medical Society at Winnipeg, Manitoba, February 17, 1928.

size so long as the condition which brought it into being continues to operate? Further, the bladder now being a very muscular organ, each contraction is bound to expend a part of its energy in distending this pouch, the whole working together to produce a cavity (diverticulum) branching from the true bladder, which cannot be illuminated by the cystoscope in the ordinary manner.

The cases in our clinic at St. Boniface Hospital have been found most commonly in the posterior and lateral walls, less often in the vault, and rarely in the anterior superior area. The vicinity of the ureteral orifices is stated to be a common site; 2 of our 18 cases were in that location.

The identification of a diverticulum presents no particular difficulty where experts with the cystoscope and the x-ray are available; even with the assistance of one or other alone very few would be passed. This being the case, it seems almost useless to enter into a lengthy description of a very vague symptomatology, which, no matter how carefully it is considered, is never positive, and must necessarily be confirmed by either one or other of the clinical procedures mentioned above. Diverticula are most frequently observed in the ordinary course of cystoscopic examination, the aperture in the bladder wall standing out as a dark slit or rounded black spot, as sharply defined as the pupil of the eye (each being an opening into a dark chamber). If, on account of inflammation, œdema, intolerance of instrumentation, deformity, or some other reason, satisfactory dilatation and observation of the whole interior with the cystoscope cannot be made, and diverticulosis has been thought of, all doubt may be removed by making a cystogram. This means the passing of a urethral catheter with the usual care in the usual way; first, taking a plain plate to exclude calculus, then emptying the bladder and refilling it to capacity with a 10-15 per cent solution of sterilized sodium bromide. Three x-ray exposures must be made, one antero-posteriorly, one with the pelvis inclined to the right, and one to the left; this to avoid missing small diverticula which may be situated at or near the median line in front or behind. The advantage of the cystogram is, that it will show up small pockets which are hidden in the maze of trabeculation and may

escape the observation of the cystoscopist, and that it gives an accurate idea as to the size and location of the sacs. It does not, however, in any sense, replace the cystoscopic investigation. The illumination of the sac itself, by the insertion of the instrument through the aperture into the cavity, is occasionally possible.



FIG. 2.—Catheter coiled in a diverticulum near a ureteral orifice.

In some bladders the trabeculations mark off a number of fossæ, the depths of which are more or less thrown into the shadow. (See Fig. 1). It is customary to explore these with the ureteral catheter, by which means a very accurate estimation of their depth and capacity may be made; judging by the size of the catheter used, the length inserted, the ease with which it is coiled, and perhaps by the x-ray plate showing the coiled catheter. Fig. 2 shows a catheter coiled in a diverticulum, the orifice of which was only one of several darkened openings in that vicinity.

Working on the presumption that it is impossible to know too much about a patient prior to operation, there is little room for doubt that, except in a few cases and for special reasons, the cystoscopic examination should be made a part of the preparation for prostatectomy, to exclude papilloma, malignancy, stone, diverticula, etc. We are aware that there are those who will decry the necessity for this, but we

have seen a number of mistakes and some fatalities, which in our opinion would not have occurred had this practice been followed out.



FIG. 3.—Large diverticula.

In ordinary catheterization it is often a matter of some difficulty to be certain that the bladder is empty; it is more difficult, and frequently impossible, to know when a diverticulum is empty. In many cases they do not empty themselves completely at any time, but become reservoirs for stagnated urine, cut off almost completely from the currents in the bladder, ideal places for sedimentation and especially adapted to calculus formation, store houses for bacteria, pus and toxins.

Fig. 3 shows multiple diverticula, coincident with prostatic obstruction and a large residual urine. This man came to the clinic with a ready-made diagnosis that he had two bladders, describing very volubly how he could empty his bladder once, and in five minutes pass just as much more. This is easily explained when one looks at his cystogram. (Note: These plates are all presented as though the individual were standing with his face toward the reader, and when, in describing, the words right or left are used, they refer in every case to the right or left of the patient). Here you find the bladder pushed to the right side by a diverticulum of a much greater capacity than itself, the wide neck connecting them being

plainly seen; also two smaller sacs at the upper right portion of the bladder, nearly in the mid line. One would like to draw attention to the smooth regular contour of the diverticula in each case, as compared with the marked irregularity of the bladder proper. The reason for the difference is easily explained by the absence of muscle bands in the wall of the sac, which distributes the resistance to dilatation equally over the whole surface; while the bladder, on account of the trabeculated arrangement of its muscular coat, allows deep pits to form in the intervening spaces, thus presenting a very irregular surface, both to the cystoscope internally and by the cystogram externally. This man urinated in the usual way, but in the face of the muscular contraction of the bladder against the resistance of his prostatic obstruction, the diverticulum remained full or even increased its content. It was only when relaxation occurred that the diverticulum drained into the bladder and he was again able to void.

When one considers the usual flimsy nature of the diverticular wall, it is easy to believe that the larger they grow the less resistance they have to offer to the bladder-pressure, and, since they possess no contractile fibres, that many never at



FIG. 4.—Multiple diverticula.

any time empty themselves completely. This is more readily appreciated after one has observed with the cystoscope, as the bladder was being

emptied, the mouth of the diverticulum diminish in size until it almost disappeared, establishing an isolated chamber in the vesical wall, which, in the presence of infection and pus, is to all intents an abscess when the bladder is empty. Fig. 4 shows multiple diverticula coincident with prostatic obstruction. This case was badly infected and the residual urine thick with pus. After careful lavage of the bladder, about four ounces of pus were drained from two of these pockets with a ureteral catheter, showing quite well that frequent irrigations of the bladder do not cleanse the sac, and the futility of attempting to clear up a cystitis in the presence of an infected diverticulum. (It must be admitted that an infected bladder means an infected diverticulum if such is present).

Inflammation in the diverticulum sac may mean the formation of adhesions to neighbouring viscera, which may hold the cavity wide open, even when the bladder has completely emptied itself. Likewise, this inflammation may cause a thickening of the wall, giving it a rigidity that it otherwise lacks, limiting its expansion, and thus diverting the force of intravesicular pressure to other weak spots, thus increasing the probability of the formation of other diverticula. In some cases, as in Fig. 5, where the orifice of the ureter and the diverticulum are very close together, it is possible that, if the mucosa is pulled into the sac as it is distended, the traction may dislocate the ureteral orifice into the sac as well and give rise to more or less ureteral obstruction.

Fig. 5 shows a large diverticulum bulging from the immediate vicinity of the left ureteral

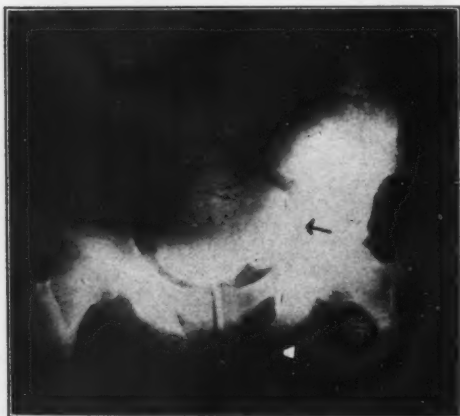


FIG. 5.—Diverticulum pressing on a ureter.

orifice. Either direct pressure by the sac on the ureter itself, or interference with the function of the orifice, caused impediment to the flow of urine, with some pain in the left side and groin, and a moderate hydronephrosis. The symptoms cleared up after operation. This case also, if carefully observed, shows a calculus in the centre of the diverticulum.

As has been already mentioned, a diverticulum is a very suitable and common location for the formation of calculi. It is not unusual to find dumb-bell-shaped stones, which lie half in and half out of a diverticulum, often difficult to diagnose as such, but very disconcerting to the surgeon, when he finds after a successful operation that he has removed only half of the calculus.

Neoplasms have been reported as occupying those pockets. There would seem to be no reason for surprise at finding them so situated, but in our cases none have so far been observed.

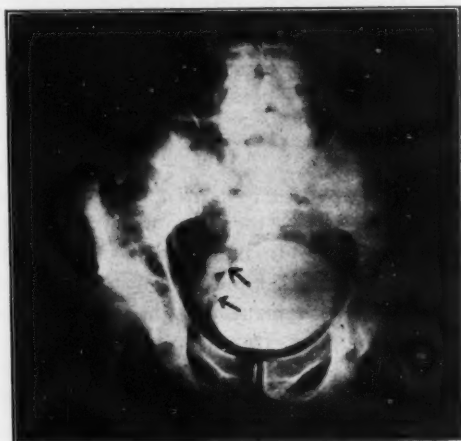


FIG. 6.—Multiple diverticula.

As shown in Fig. 6 a diverticulum on the left posterior surface was seen through the cystoscope, but the cystogram disclosed two more on the upper right area, which had very small apertures. This case, like the others, was associated with prostatic obstruction and a moderate amount of residual urine. Although all these figures have shown multiple diverticula, it must not be inferred that such is the rule, since the single diverticulum is the more common. The former are usually of longer standing, are more exaggerated, and thus better for demonstration purposes.

Diverticula must be very rare in women, since

no case has been diagnosed in our clinic during the last five years. Calculus in women is also very uncommon, since we found only one case in the same period. Therefore, we believe that, as both of these conditions usually occur where there is more or less obstruction, and as this is almost never found in women but is very common in men, we have here one of our best arguments in favour of the obstructive etiology of diverticula of the urinary bladder.

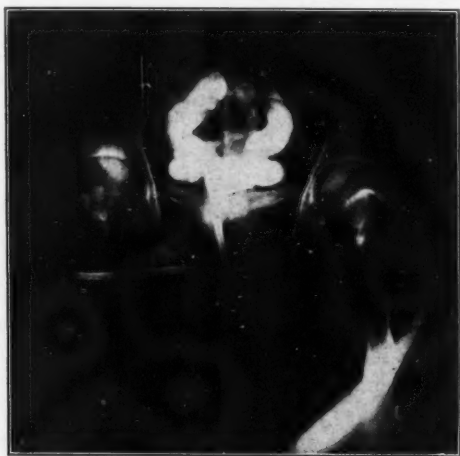


FIG. 7.—Hydro-ureter.

Fig. 7 is from a young man, aged 23, with a tremendous bilateral hydronephrosis and hydro-ureter: 12 c.c. of sodium bromide were used to make the plate, which shows the tortuous ureters distended to the size of the small intestine. He had a valvular impediment in his posterior urethra, and his picture shows better than any other case we have had, the effects of infection, frequency, and muscular contraction in the face of an obstructed urethra, which in time overcame the resistance of the ureteral orifices to back pressure, and converted the ureters into a pair of large diverticula. The bladder has ceased to function as such, having become merely a bundle of contracted muscle and fibrous tissue, that cannot be distended under any circumstances: his ureters and kidney pelvis have had to assume the double duty of ureters and bladder for at least eight years.

CONCLUSIONS

The purpose of this address is to call attention to the fact that while diverticulosis of the urinary bladder may not be of very frequent occurrence from the standpoint of any single individual in general surgery, it is, nevertheless, fairly common to the urologist; so common, in fact, that in every case of prostatic obstruction it must be carefully ruled out. If its presence is not recognized before operation there is little chance of its being revealed by a careful search at operation. Even when the approximate location has been designated by cystoscope and cystogram, the orifice may be difficult to locate through the suprapubic incision.

If one starts boldly into a prostatectomy in a case such as that depicted in Fig. 4, in blissful ignorance of three diverticula, he will probably never be able to account for or treat satisfactorily an intractable post-operative cystitis which will hound his patient to a premature grave.

A diverticulum in an uninfected bladder is one thing and is relatively easy to obliterate; a diverticulum in an infected bladder, plus infection of the diverticulum, with adhesions all around, with contracted and thickened vesical walls, is another thing entirely, and the procedure relatively difficult, in some cases of multiple diverticula being next door to impossible.

Since all bladders, whether infected or not, become so during the prostatic operation, the time to remove the sac is at the first stage; if this opportunity is missed or neglected, the chance for a relatively simple operation has also passed.

The number of diverticula that can be successfully treated by bladder-irrigation and the administration of urinary antiseptics *per os* are so few that this possibility should not be considered, at least when confronted by the necessity for prostatic surgery.

REFERENCE

1. Young's Practice of Urology, i, 37.

An Address
ON
THE CHRONIC GALL BLADDER*

BY JOHN B. DEEVER, M.D.,

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BEFORE entering upon the subject matter of my discussion, I wish first of all to thank you for the honour and the privilege of taking part in your programme, and secondly (and I hope I am not revealing any secrets) to disclaim any responsibility for the choice of my subject. It would require more than my natural temerity to suggest speaking on the chronic gall bladder, inasmuch as I appear to have done so on so many occasions that I might be accused myself of having a new form of disease, which might be termed "chronic gall bladder discussion." But the fact that your secretary saw fit to ask me to speak upon the chronic gall bladder gives me courage to conclude that my symptoms are not dangerous and that you are not afraid that anything I may say may be contaminating. I fear, however, that I am not able to tell you anything that you do not already know, but I hope, at the same time, that my viewpoint, in any differences it may show from yours, may be of some value.

It goes without saying that what we know to-day about abdominal ills which mankind is heir to has been made possible only since the introduction of anæsthesia, asepsis, and antiseptics provided a means of studying pathology, not in its end-results in the post-mortem chamber, but as it appears in one stage or other of its development and progress in the living subject, whether in the human subject or by the experimentally produced lesion in the animal. Among the topics that form, as it seems, endless sources of discussion and investigation the gall bladder occupies a very prominent place. Its problems are numerous, and by no means solved to the satisfaction of those concerned, more particularly the patients themselves. It is true that with the removal of the diseased gall bladder a satisfactory percentage of cures is being estab-

lished, and we find our patients rejoicing in a new birth, full of the joy of living, but we have indifferent results to temper our pæans of triumph. However, it is much like putting the cart before the horse to speak of end-results before discussing what has brought them about.

With the first one-stage cholecystostomy by Dobbs in 1867, and the first cholecystectomy by Langenbuch in 1882, were laid the foundations of gall-bladder surgery, and light began to be shed on gall-bladder pathology. Furthermore, when it was evident that the human subject can get along fairly well without a gall bladder, it was only natural to push the inquiry as to the actual function of this organ, as remarkable as it is troublesome. Is it designed merely to be a troublemaker, a focus of infection, a subject of study for avid investigators and of discussion at meetings of this kind? Or, does it actually play an important part in the body economy? The last question is readily answered by the healthy gall-bladderless women and men that walk this earth in comparative ease and comfort. The other questions are not so easily answered.

As to function there is much that we do not know as yet, but the generally accepted facts are that the gall bladder receives its bile from the liver, and concentrates it; that it has great absorptive powers; that the products of absorption are carried off by way of the lymphatics and blood-capillaries; and that normally small quantities of bile are regularly and systematically excreted into the common duct and thence into the digestive tract. It is interference with this latter function that marks the beginnings of so-called gall-bladder dyspepsia, with its immediate and remote sequelæ. Bile stasis, as we all know, may form the nucleus of stone, and stone is the nucleus of a large percentage of gall-bladder trouble. What causes this interference with the natural excretory

* Read before the Toronto Academy of Medicine, Toronto, March 6, 1928.

function of the gall bladder? Is it infection? In most, if not in all, instances yes; and, furthermore, the gall bladder may become the focus of infection for systemic and cardiovascular disease. Charles Mayo has emphasized this point by his statement that the gall bladder once infected becomes a probable focus for aggravation of existing disease of the heart muscle. This has also been stressed by others, particularly by Babcock, of Chicago. No doubt I am not the only one among you who has been called upon to remove the gall bladder in cases of this kind, so precious to the heart of the heart-specialist both here and abroad, and so dear, financially speaking, to the bearer of the diseased gall bladder. I have just recently discharged such a patient. She had been going to Bad Nauheim for 18 consecutive summers for treatment of a heart condition, which no doubt will finally be cured now that her gall bladder is out.

Infection of the gall bladder is rarely a primary affair; in most instances the organ becomes secondarily infected by organisms which may be carried by several routes, notably the blood stream, the lymph channels and the bile stream, and also by direct extension through contact with a neighbouring diseased viscus or viscera. I have consistently advocated the lymphatic route from the liver as a frequent pathway, a theory which receives confirmation by the now familiar observation of the association of hepatitis with practically every gall bladder removed at operation to which a specimen of the liver is accidentally or purposely left attached.

From clinical observation, I would say of equal importance with the lymphatic route is the ascending infection by way of the bile-stream. The association of achlorhydria or hyperchlorhydria in a certain percentage of gall-bladder cases, as recently observed by Moynihan, demonstrates the possibility and frequency of this route of infection, and, furthermore, Moynihan believes that the achlorhydria may be responsible for lesions of the appendix which may form the starting point for infection of the bile as it descends from the liver. On the other hand strong confirmation of the view that the blood-stream is the route for streptococic infection has again been provided by your countryman, A. L. Wilkie, working in

the clinic of Prof. D. P. D. Wilkie of the Royal Infirmary, Edinburgh and the Surgical Research Department of the University of Edinburgh.

Direct extension from an adherent viscus is not a very frequent occurrence. Such an event, as it happens, was recently observed in my clinic. The patient, a man aged 55 years, came in with a history of five weeks of digestive disturbance, consisting mainly of paroxysmal attacks of pain coming on about two hours after meals, and relieved by cathartics (castor oil or magnesium sulphate.) Constipation, loss of appetite, and of ten pounds in weight formed part of the history. But there was no vomiting, and the stools and urine were normal. Fluoroscopic study of the gastro-intestinal tract showed pyloric obstruction, and a cholecystogram showed a defective shadow indicating gall-bladder involvement. At operation, a perforated ulcer, 2 cm. in diameter, was found on the lateral surface of the duodenum. The gall bladder which was otherwise normal, had plastered itself over the ulcer, thus preventing perforation into the intestinal cavity. After separating the gall bladder from the ulcer, the indurated ring around the ulcer was excised with the ulcer and a pyloroplasty operation done. The gall bladder was not disturbed. It will be interesting from several points to follow the further progress of this case, especially with regard to the effects of the duodenal lesion on the gall bladder. While this is not very unusual, it is a good illustration of how the gall bladder can become infected by contiguity.

An indisputable fact is that the gall bladder if once infected is always infected. The extent of possible damage will, of course, depend upon a number of factors, mainly the person's resistance and general constitution. In view of this fact, the importance of early recognition of gall-bladder symptoms becomes self-evident. Indeed, in all surgical diseases the great desideratum is to prevent their progression to the stage where surgery is not only demanded but offers the only chance of relief. In other words, preventive surgery is just as much the slogan of the surgeon as preventive medicine is of the internist, but the surgeon must have the help of the latter in striving to make the slogan effective.

It is a well-established fact that, next to

chronic appendicitis, chronic disease of the gall-bladder is the most common cause of epigastric discomfort. Gall-bladder dyspepsia is Moynihan's significant title for the story of flatulence, fullness after meals, more or less marked epigastric discomfort which may amount to actual pain, which if present usually radiates around to the back and up between the shoulder blades. The early case, however, does not often present this typical pain. The stomach shows early selective action in its intolerance of greasy, heavy, and acid foods, and acceptance of a soft bland diet. The fact that the epigastric distress may at times be relieved by alkalis is the reason that some of these cases are diagnosed ulcer and yield temporarily to an ulcer regime. Sooner or later the truth will prevail.

One of the difficulties that confronts the internist as often as, if not more often than, the surgeon is the proper evaluation of early symptoms. In the case of the gall bladder, this difficulty is being to some extent overcome by the Graham-Cole method of diagnosis by means of cholecystography. This is supposed to supply the desired aid and should be especially valuable in the early case where the lesion is still functional and not yet organic. As Graham himself states "Cholecystography is really a means of studying the functional activity of the gall bladder rather than a means of indicating the exact pathology present." The question arises as to what degree of functional derangement, as shown by the cholecystogram, would warrant operative interference. Moynihan goes so far as to condemn every gall bladder to excision if, in the presence of what he calls "inaugural" symptoms, the cystographic shadow is absent, its opacity diminished, or its appearance delayed.

It seems to me that the clinical aspect of the case still demands and should receive most of our attention. Where the clinical picture is indefinite, even though the cholecystogram indicates functional impairment, I doubt whether operation on the gall bladder will give the desired result. It is my experience that, in some of these cases, at least, when operating to remove the appendix and at the same time I examine the stomach, duodenum and gall bladder, I find these to be normal to all appearances. On the other hand, definite clinical symptoms, even in the absence of cholecystographic findings, would

not contra-indicate operation. This is an important point, which cannot be too strongly emphasized. It is a common experience that the best effects of gall-bladder surgery, especially cholecystectomy, are obtained in the cases that give a very definite history of gall-bladder or gall-stone colic. There are cases which present definite gall stone colic which at operation fail to show any gall stones. I would, therefore, say that, in advising the removal of the gall bladder, the history should be at least suggestive of involvement of that viscus, and the physical examination at the same time should show definite local tenderness, rigidity and occasionally a palpable fundus. In the long-standing cases, also, the anterior border of the liver will be thin and hard or rounded to palpation. The sharp anterior border suggests more advanced disease than the rounded border. These are points to be considered in deciding upon operation as well as upon the type of operation. It is in just these cases that the clinician can make the diagnosis without the aid of the cystogram, and, as I see it, it is likewise in the same type of case that the cholecystogram gives the most accurate evidence of disease, that is to say, in the case where the clinical manifestations are also quite clear. Permit me again to quote Graham. "The degree of alteration necessary to produce alteration of function is so slight that only histologic examination could detect it." Such slight impairment of function it seems to me would scarcely warrant surgery. Nor would non-surgical bile-drainage be indicated. In fact, I doubt whether non-surgical drainage is ever of permanent value. This doubt is supported by observations by Dr. Stanley Reimann of the Lankenau Research Laboratory (published in the *J. Am. M. Ass.*, April 17, 1920). More recent work, especially the study made by A. L. Wilkie of Montreal, in the service of Prof. Wilkie of the Royal Infirmary of Edinburgh and the Surgical Research Department of the University of Edinburgh, show that in the vast majority of cases of chronic cholecystitis in the human subject the bile is sterile, and, though streptococci could be isolated from the submucosa and the outer coats, leaving the mucosa intact, culture of the entire gall-bladder wall consistently failed to reveal a growth.

The important findings in Wilkie's work were first that in a majority of cases the bile was

sterile. This has been the experience of the Research Laboratory of the Lankenau Clinic, where studies of smear and culture of the bile in several hundred gall bladders removed at operation have been made. Unfortunately, we did not study histologically and bacteriologically the cystic gland, as Wilkie has. We nearly always find enlargement of the cystic gland and of the gland in relation with the terminal portion of the supra-duodenal or first portion of the common duct. The cystic gland, draining the entire submucous and outer coats of the gall bladder, suggests bacteriological examination of this gland as well. Before removing a gall bladder that grossly does not show much change, I always look for the presence of an enlargement of the cystic gland, as well as of the gland in relation with the lower end of the first portion of the common duct.

In the light of the facts brought forth in Wilkie's work, it is interesting to note that in his experimental production of cholecystitis by the injection of streptococci isolated from the cystic gland directly into the lumen of the gall bladder, and into the gall-bladder wall with the cystic duct occluded, and intravenous injection into the gall-bladder wall with occlusion of the cystic duct, subsequent examination of the gall bladder and liver showed conditions often found at operation upon the human subject, *i.e.*, general or interstitial cholecystitis with liver changes, peri-cholangitis and, in the more advanced cases, more extensive gall-bladder and liver changes.

By separating the gall bladder from the liver, and giving the dye intravenously, cholecystitis developed, making it appear that cholecystitis is a blood-borne streptococic, intra-mural infection, not before proved. This admirable study suggests that, in the great majority of cases, the bile is not only sterile, but inhibits the growth of streptococci. This experimental work has especially interested me, as I have always believed and taught the lessons Wilkie has so brilliantly demonstrated to be true, namely, the important part that the lymphatics play in gall-bladder disease. Furthermore it must also change our conception of the cause of cholesterol stones.

Chronic disease attacks the gall-bladder mucosa alone as a catarrhal, or the whole wall, as a general interstitial process. Either type

may be associated with stone, though calculous cholecystitis is usually an interstitial or mural disease. The diagnosis of calculous cholecystitis presents less difficulties than does the non-calculous condition, because the attacks of gall stone colic usually tell the story. The picture, especially when coloured by jaundice, is too familiar to require re-drawing. It is the non-calculous cholecystitis that presents the difficulties, and, as I have already indicated, these are not always solved by the cholecystogram. This applies especially to the case in which the symptoms are due to an appendix in a high position. I have so often stressed this point in public, and more often demonstrated it in my clinic, that I shall not dwell upon it again.

The indication for operation in these cases is the history of attacks at first occurring at wide intervals but later becoming more frequent and more severe, and the physical finding of tenderness at the site of the lesion. If at operation the gall bladder is found to be the cause of the trouble cholecystectomy is the procedure of choice. The appendix should also be removed. I personally am thoroughly convinced that the appendix plays a very conspicuous rôle in the etiology of chronic gall-bladder disease, which is either associated with or a sequel to disease of the appendix.

The question of cholecystectomy versus cholecystostomy has been thoroughly thrashed out by this time, the verdict being in favour of removing the organ whenever possible. The conservative operation is nowadays reserved for the very acute case where radical surgery presents more of a risk, and in the obese subject, on whom a cholecystectomy would be unusually difficult. Experimental work clearly proves that, with few exceptions, cholecystostomy is only a palliative procedure and not in any way curative. This is borne out by the clinical results of surgeons who have had a large experience in this class of work. I would say that cholecystostomy is an easy way of getting out of what is sometimes a difficult situation. May it not be proper for me to say that under such circumstances the patient has not been given a square deal? Unless we can say this experimental work has been for naught, does not the patient who has had a cholecystostomy in preference to a cholecystectomy remain subject to the same risk of cholecystic disease with the for-

mation of stones and excursions of the latter into the deeper ducts, invasion of the liver, pancreas, etc., as before the drainage operation? It is hard for me to understand how the surgeon reasons who performs this drainage operation, be it direct drainage to the outside or by way of a cholecysto-gastrostomy or cholecysto-duodenostomy.

In calculous cholecystitis the presence of jaundice complicates the situation, not only with regard to the type of operation, but more especially as to the opportune time for interference. Jaundice in these cases indicates obstruction, usually due to stone in the common duct, or choledochitis, or cholangitis, or to subacute inflammation of the head of the pancreas. Obstructive jaundice, such as that caused by stricture of the common duct or tumour of the head of the pancreas, does not enter into consideration here. Fortunately, considerable progress has been made in the pre-operative treatment of obstructive jaundice. Changes in the blood-chemistry can now be measured and combated. Delayed coagulation-time is effectively reduced by intravenous injections of calcium chloride, or, where this fails, blood transfusion can be resorted to. Dehydration is obviated by forcing fluid intake and proctoclysis or subcutaneous injections of physiological salt solution. The bilirubin-content of the blood is determined by the delicate Van den Bergh test. This is particularly valuable in the case of latent jaundice, which often occurs in patients with stone in the common duct. These patients are apt to show the same tendency to hemorrhage as those with frank jaundice. The Van den Bergh test will detect these latent types and prevent precipitate operation and the dire consequences that might have resulted from the same. The coagulation-time of the blood, however, should always be taken.

In this connection I would call attention to the timely warning of Dick and Wallace against the administration of the dye-test in cases of calculous obstruction of the common duct. The dye in such cases produces degenerative changes in the liver, that is in the cytoplasm of the liver cells, leaving the nuclei unaffected, and normal bile containing tetraiodophenolphthalein introduced into the pancreatic ducts will produce an acute pancreatitis. Calculous obstruction of the common duct, as

we all know, represents a condition favourable for the retrojection of bile into the pancreas, so that in cases of obstinate jaundice the administration of the dye is distinctly dangerous, in fact much more so than opening the abdomen. The toxicity of the dye on the liver is greater in the presence of any pathological condition in the liver, on the principle that the organ's function is already impaired. While the dye is almost entirely eliminated by the kidney in biliary obstruction, no ill effects apparently ensue in the normal kidney, nor is this to be expected, as the rate of excretion is slow. This precludes the use of the dye as a liver-test in obstructive jaundice. I have always been just a little skeptical about the universal use of the dye where the clinical study made evident the presence of some condition that could only be relieved by operation, I have escaped therefore possible mishaps, not knowing, until the work of Dick and Wallace, the risk of its administration in other than selected cases. I, with other surgeons, see many cases of mild jaundice due to conditions other than obstruction of the common duct, for example, cholangitis, where administration of the dye could only be of benefit in gauging the efficiency of the liver to withstand operation. Cases of the latter type, painless in character, associated with chronic gall bladder disease, not having yielded to medical treatment become surgical, requiring operation irrespective of the cystographic findings.

In performing the operation of cholecystectomy every surgeon has some preference as to certain details. As in practically all abdominal surgery, a good exposure is of primary importance. Some surgeons work by starting at the fundus. I believe this is not advisable, inasmuch as blood from the denuded surface of the liver may run down and obscure the view and precious time is then lost in sponging the blood away. The safer method is to begin at the cystic-duct end of the gall bladder. After opening the peritoneal cavity, the right lobe of the liver is rotated to the right and at the same time is pulled lateralward and upward. This, of course, cannot be done if perihepatic adhesions are present. Rotating the liver brings its under-surface forward and permits inspection of the gastrohepatic omentum. This latter is incised and the respective leaflets reflected. This exposes the com-

mon duct, the terminal portion of the cystic and the terminal portion of the hepatic duct, and the point of junction of the cystic and common ducts. This exposure is important, since anomalies are frequent in this region, and it is only by having a clear view that these can be recognized and dealt with, thus avoiding operative accidents, especially to the common duct. Should the infundibulum of the gall bladder be adherent to the gastro-colic omentum overlying the common duct, and thus obscure the cystic duct, it will be necessary to release the adhesions in order to visualize the cystic duct. The Cameron light is a material aid in this dissection. After placing hæmostats on the cystic duct, close to the common duct, the duct is divided between the hæmostats and tied off, unless the common duct is explored by passing a probe through the distal end of the divided duct or drained by passing a small catheter through the stump of the duct. The cystic artery is next exposed, clamped, cut and tied. The gall bladder is then snipped from its bed for a short distance. In this way the gall bladder can be used as a tractor. The gall bladder is then removed and the gall-bladder bed closed. If the common duct is to be explored this is done before removing the gall bladder, using the latter as a tractor. The duct is thus thrown forward and as in such cases it is usually distended, it is easily recognized. The question of drainage depends upon the bacteriologist's report of smears made and examined while the operation is proceeding. When indicated, a glass tube is placed in the subhepatic fossa, or a rubber tube is introduced into the bottom of the wound.

To the practised surgeon, the procedure as outlined above is a simple one, especially in the uncomplicated case. But, as we all know, the complications of cholecystitis make for complicated surgery. This is especially true when stone or stones can be palpated in the common duct. The stones should be gently milked into the supraduodenal portion of the duct, as this portion of the duct is the easiest to open. In other words, the incision for choledochostomy is best done below the entrance of the cystic duct, but if the stone is impacted it can be made at the most convenient point. It is best to aspirate the common duct before making the incision, so as to be sure that one is not opening the portal vein which normally lies between and behind

the common duct and the hepatic artery. There may be some oozing from a small plexus of veins which surrounds the duct. Sometimes the gastroduodenal artery lies anterior to the suprapancreatic portion of the common duct, but with a good exposure of the duct this will easily be recognized. When a stone is impacted in the retroduodenal or retropancreatic portion of the duct, the duodenum must be mobilized and turned downward, to expose the site of the impaction. Sometimes, when the stone is friable, it may be necessary to crush it between the fingers and thumb, and extract the fragments with a scoop through the incision in the common duct, or it may be necessary to use the gall stone scoop for pushing the stone or stones onward into the duodenum. An important point is to explore the hepatic duct for the presence of stones. A certain percentage of recurrences of gall-stone symptoms are due to overlooked stones in the hepatic duct. This is not always the fault of the surgeon, as these may reform in the duct after the operation, or the stones may possibly escape detection even after the most painstaking search; or, in the exploration of the common duct, one or more stones may have been displaced upward beyond reach, and may later lead to common-duct obstruction and to re-operation.

Recurrence of symptoms after gall-bladder operation, as I indicated at the onset of my remarks, is of sufficient frequency to demand consideration. Recurrent cases may be considered under two headings; the individual patient, and the sequelæ of disease and of surgery. In the first grouping a potent cause is the failure of the patient to observe a proper diet after operation. In many instances this may be traced to the great relief afforded by the operation, so that the patient joyfully proceeds to satisfy a long unsatisfied appetite for good things to eat. These cases usually yield to a corrective diet and regime. Other factors in this group are neurasthenia, and a calculous diathesis. The former, you will all agree, is the bane of the doctor's existence. The latter may yield to dietary regime, but oftentimes re-operation may be the only thing that affords relief.

In the second grouping a strong factor for recurrences of symptoms is extensive and late pathological lesions found at the original operation. Most of this group require re-operation.

Among the findings in these cases operated on after a cholecystectomy may be mentioned: adhesions; persistent chronic infection, involving the pancreas; stone in one of the bile ducts, most often the common duct; sometimes also enlargement of the glands along the common duct, especially the gland at its junction with the duodenum; stricture of the common duct; carcinoma of the head of the pancreas; and occasionally biliary fistula. Other conditions encountered are, hepatitis and cholangitis with enlargement of the spleen.

Adhesions sometimes produce deformity of the duodenum, binding it to the gastro-hepatic omentum and the liver, which may lead to a traction diverticulum. Any of these conditions warrant surgical interference, but the least satisfactory results are to be expected from the release of adhesions. As every one knows, and the patient best of all, they are apt to recur. Most of the conditions yield to prolonged biliary drainage. A special point to which I would call your attention is the more satisfactory results obtained by biliary drainage and splenectomy in the cases of hepatitis associated with splenomegaly, compared with the same type of case without the splenic enlargement. The only explanation I can offer for this fact is that removing the enlarged spleen probably reduces the tax on the liver. The operative findings in these cases are fibrosis of the enlarged spleen, and circumscribed areas of fibrosis in, and abnormal firmness and density of the liver. I am able to demonstrate this by rotating the right lobe of the liver into the wound and compressing the liver with the fingers. In the absence of splenic enlargement, the left lobe of the liver is usually unchanged in appearance and to the touch.

In these recurrent cases, as I have already said, cholangitis is usually associated with the hepatitis which forms part of the cholecystic infection. The interference with liver function, which the cholangitis causes, may persist for some time after operation and explains the digestive disturbances, such as epigastric fullness, formation of gas, etc., after meals. I find that the more pronounced these symptoms, the greater

likelihood that the cholangitis overshadows the hepatitis. For this reason these cases do not, as a rule, yield to the regime usually prescribed, such as exercise, horse-back riding, golf, etc., careful diet, cures at the various spas, and various types of heliotherapy. The results of these measures are usually only temporary, and surgical biliary drainage will finally have to be resorted to. It is true that the latter sometimes has to be repeated, but in most instances permanent results are obtained within a year at the longest.

For persistent infection involving the peri-pancreatic lymph nodes and the head or even sometimes the body of the pancreas common-duct drainage is the only treatment. This may at the same time forestall the development of diabetes. I think your distinguished colleagues Macleod and Banting will agree with me in this. Choledochitis likewise requires drainage, that is prolonged T-tube drainage. If the ductal exudate does not resolve spontaneously, and surgery fails to come to its rescue, obliteration of the lumen and stricture of the common duct takes place sooner or later. The serious effect of such an event is the persistent jaundice and all that it implies, leading to death. Stricture may, it is true, be caused by operative injury to the common duct and the surgeon be held responsible for the same. But this, as you see, is not always the case.

In view of the pathological possibilities of the chronic gall bladder, and particularly in view of the fact that surgery does not always at once establish a cure, the importance of intensive study and investigation becomes evident. First of all the surgeon must be able to interpret the pathological condition correctly and as far as possible correct it. For this, experience and acumen are the greatest assets. The physiologist and the chemist must continue their valuable investigations and contributions to the study of the disease. Perhaps some day, and that not in the far distant future, the combined work of the surgeon, the pathologist, physiologist, bacteriologist and chemist may solve some of the problems which we are now discussing.

STUDIES IN PERNICIOUS ANÆMIA. IV. THE RELATIONSHIP BETWEEN
CORPUSCULAR HÆMOGLOBIN AND CHLORIDE CONTENTS
IN THE ANÆMIAS*†

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IN a previous paper of this series¹ the following conclusions were stated:

"Plasma chlorides in the anæmias are constant.

"Cell-chloride contents in pernicious anæmia (active and remission stages) are low.

"Cell-chloride contents in the majority of cases of secondary anæmia tend to be above normal.

"By contrast, plasma and cell-chloride contents are *both* lowered in diabetes mellitus and other conditions where increase of blood constituents requires osmotic compensation, and in acute intestinal obstruction.

"The lowered cell-chloride content in pernicious anæmia is probably due to an osmotic adjustment to an increased cell-hæmoglobin content."

In this paper we record the results of an endeavour to associate cell-chloride content with the cell-hæmoglobin content.

The technique of determination of plasma and cell chlorides was fully outlined in the previous paper. Since the erythrocytes contain practically no sodium, it seems desirable to express all results in terms of chloride-chlorine (multiplying NaCl figures by the factor 0.61), and all results are so expressed in this paper.

Hæmoglobin was determined by the acid-

hæmatin method, using a macro-procedure with 1 c.c. of blood. The standard was prepared by the Cohen and Smith procedure, and standardized by determining its oxygen capacity by Van Slyke's method.² It may be remarked, in passing, that in almost every case a determination was also made by either the Dare or Tallquist method. While for values less than 50 per cent hæmoglobin the agreement was usually sufficiently close to avoid clinical error, with values of 70 per cent or over marked divergencies were frequently obtained. We hope to deal with this point in a later paper.

In the following tables, in the second column of figures, hæmoglobin values for whole blood are expressed in percentages, taking the value 16.9 grm. per 100 c.c. as 100 per cent; while in the last column, hæmoglobin values per 100 c.c. of red cells are expressed in grm., the gram value for whole blood being divided by the figure for cell volume. (The figure 16.9, based on Williamson's results, is probably too high; cf. Osgood³ and Osgood and Haskins⁴).

Since we find it is difficult to ensure that blood samples from patients for analysis are always taken before breakfast, we determined initially the effect of a slight meal on the cell-chloride and hæmoglobin values, using a number of normal subjects. The results are shown in Table I. Of the values determined 1.5 hours after the meal, in only one case (How) was there a marked alteration in the cell-chloride value, and this we are inclined to ascribe to experimental error. In none of the determinations after 3.5 hours do the figures show changes exceeding the limit of error of measurement. We conclude that such of the de-

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† Part I, The outstanding clinical problem and the geographical distribution in Western Canada (E. W. Montgomery), *Canad. M. Ass. J.*, 1926, xvi, 244. Part II, Chloride metabolism in the anæmias, especially pernicious anæmia (Margaret G. Rioch and A. T. Cameron), *Canad. M. Ass. J.*, 1926, xvi, 251. Part III, A contrast of the chloride contents of corpuscles and plasma of blood in pernicious anæmia and various other conditions, *Canad. M. Ass. J.*, 1927, xvii, 670.

TABLE I.
EFFECT OF A LIGHT BREAKFAST ON CELL CHLORIDE AND HÆMOGLOBIN VALUES

Subject	Sex	Time	R.B.C. x 10 ⁶	Whole Blood Hb	Colour Index	Cell Volume	Per 100 c.c.		
							Plasma Cl	Cell Cl	Cell Hb
				%		%	gm.	gm.	gm.
How.	M.	Before breakfast	4.83	104	1.08	36.5	0.35	0.180	48
		1.5 hours after breakfast	4.95	104	1.05	34.7	0.34	0.150	51
Ada.	M.	Before breakfast	4.90	104	1.06	44.7	0.35	0.162	39
		1.5 hours after breakfast	4.93	109	1.15	42.4	0.34	0.162	44
Fos.	F.	Before breakfast	4.15	77	0.93	36.3	0.35	0.174	36
		1.5 hours after breakfast	4.29	76	0.87	35.7	0.35	0.174	36
		4.0 hours after breakfast	4.31	76	0.88	34.7	0.35	0.180	37
Her.	M.	Before breakfast	5.10	110	1.08	46.2	0.34	0.162	40
		3.5 hours after breakfast	5.16	103	1.00	41.5	0.38	0.156	42
Wat.	M.	Before breakfast	5.00	83	0.83	33.5	0.35	0.162	42
		3.5 hours after breakfast	5.21	87	0.83	36.7	0.35	0.162	40

TABLE II.

Subject	Sex	Age	Condition	R.B.C. x 10 ⁶	Whole Blood Hb	Colour Index	Cell Volume	Per 100 c.c.		
								Plasma Cl	Cell Cl	Cell Hb
					%		%	gm.	gm.	gm.
Mo.	M.	25	Normal	5.02	83	0.83	45.1	0.357	0.189	31
Fo.	F.	33	Normal	4.17	69	0.83	33.9	0.360	0.189	34
Fu.	M.	22	Normal	4.79	75	0.78	42.1	0.366	0.183	30
Fo.	F.	33	Normal	4.15	75	0.91	36.3	0.354	0.177	36
Tu.	M.	23	Normal	4.96	91	0.92	42.3	0.348	0.177	37
Ad.	M.	27	Normal	4.90	104	1.06	44.7	0.354	0.165	39
He	M.	23	Normal	5.10	110	1.08	46.2	0.342	0.165	40
Wa.	M.	24	Normal	5.00	83	0.83	33.5	0.354	0.165	42
Gr.	M.	21	Normal	4.89	88	0.90	34.3	0.360	0.165	43
Ho.	M.	22	Normal	4.51	87	0.96	32.3	0.345	0.165	46
Br.	M.	44	Achlorhydria	5.07	73	0.72	36.5	0.366	0.195	34
Ro.	M.	48	Achlorhydria	5.40	69	0.64	36.8	0.354	0.183	32
Sa.	M.	49	Achlorhydria	4.76	107	1.12	36.0	0.348	0.159	50
Co.	F.	36	Suspected Pernicious Anæmia	1.97	50	1.27	21.4	0.366	0.189	40
An.	F.	69	Probable Pernicious Anæmia	1.62	44	1.36	17.7	0.366	0.159	42
An.	F.	74	Pernicious Anæmia	1.34	34	1.27	11.2	0.348	0.159	52
Ho.	M.	67	Pernicious Anæmia	2.11	42	1.00	16.9	0.372	0.152	42
Pa.	F.	28	Pernicious Anæmia	1.03	26	1.26	10.4	0.363	0.152	43
Ru.	M.	53	Pernicious Anæmia	1.23	33	1.34	12.5	0.348	0.152	44
Cc.	M.	50	Probable Pernicious Anæmia	3.86	83	1.08	29.2	0.372	0.152	48
Do.	F.	48	Pernicious Anæmia	1.16	31	1.34	11.0	0.369	0.146	48
Du.	F.	48	Pernicious Anæmia	2.37	42	0.89	14.2	0.348	0.146	50
Ch.	F.	57	Pernicious Anæmia	1.83	33	0.90	11.3	0.372	0.140	50
Cr.	M.	45	Pernicious Anæmia	3.57	83	1.16	33.3	0.354	0.140	42
Su.	M.	45	Pernicious Anæmia	2.04	54	1.32	19.6	0.366	0.134	46
Go.	M.	60	Pernicious Anæmia	2.51	52	1.04	22.3	0.366	0.134	40
Sp.	M.	52	Pernicious Anæmia	1.23	34	1.38	10.3	0.363	0.134	57
Pa.	M.	22	Secondary Anæmia (from <i>Diphyllobothrium</i> <i>tum</i>)	1.11	28	1.25	18.1	0.360	0.207	26

TABLE III.

Subject	Sex	Age	Condition	R.B.C. x 10 ⁶	Whole Blood Hb	Colour Index	Cell Volume	Per 100 c.c.		
								Plasma Cl	Cell Cl	Cell Hb
								gm.	gm.	gm.
Be.	F.	41	Inoperable carcinoma of cervix with slight secondary anæmia	3.93	68	0.87	28.0	0.354	0.214	41
McN.	F.	35	Secondary anæmia associated with pregnancy.	3.31	40	0.60	23.7	0.378	0.207	29
Le.	F.	56	Carcinoma of stomach; operation; secondary anæmia.	3.70	43	0.58	25.0	0.366	0.201	29
Ku.	F.	45	Menorrhagia; secondary anæmia	3.73	48	0.64	19.8	0.372	0.201	41
Co.	F.	55	Inoperable carcinoma of vagina.	4.39	83	0.95	34.4	0.390	0.189	41
Bu.	M.	58	Carcinoma of stomach; with secondary anæmia	2.85	29	0.51	17.4	0.360	0.183	28
St.	F.	17	Metrorrhagia; secondary anæmia.	1.96	30	0.76	14.5	0.372	0.183	34
Br.	M.	45	Carcinoma of stomach; secondary anæmia.	2.04	23	0.56	10.0	0.369	0.183	38
Ch.	F.	39	Fibroid of uterus; hæmorrhage; secondary anæmia.	4.78	53	0.55	23.6	0.366	0.183	38
As.	F.	40	Menorrhagia; secondary anæmia	1.68	22	0.65	10.1	0.360	0.177	37
Ho.	F.	41	Carcinoma of breast and bone; slight secondary anæmia.	3.76	61	0.81	27.3	0.354	0.177	38
Pe.	F.	40	Postpartum hæmorrhage; secondary anæmia.	2.40	32	0.67	13.5	0.372	0.177	40
Ro.	F.	30	Abortion; secondary anæmia.	1.40	46	1.64	17.1	0.384	0.177	45
Br.	F.	28	Postpartum hæmorrhage; secondary anæmia.	3.32	43	0.65	15.9	0.390	0.177	46
Lu.	F.	27	Abortion; secondary anæmia.	2.53	48	0.95	15.9	0.372	0.177	51
Li.	F.	43	Carcinoma of stomach; secondary anæmia.	2.18	36	0.83	15.9	0.378	0.165	38
Pe.	F.	45	Inoperable carcinoma of cervix, bladder and rectum.	4.45	91	1.02	34.3	0.351	0.165	45

terminations on patients as have been made on samples of blood taken just before a midday meal, after several hours without food, are accurate and comparable with those taken before breakfast on a fasting stomach.

The degree of error of the chloride determinations, we estimate, should not exceed plus or minus 0.006 gm. per 100 c.c. material; that of the hæmoglobin (cell) determinations should not exceed plus or minus 2 gm. per 100 c.c. cells.

In Table II are given the results for normal subjects, cases of pernicious anæmia, certain probable cases of pernicious anæmia (not definitely diagnosed), three cases of achlorhydria without other detectable abnormality, and a single case of anæmia associated with *Diphyllobothrium latum*.

In Table III are given the corresponding results for a number of cases with secondary anæmia of varying origin.

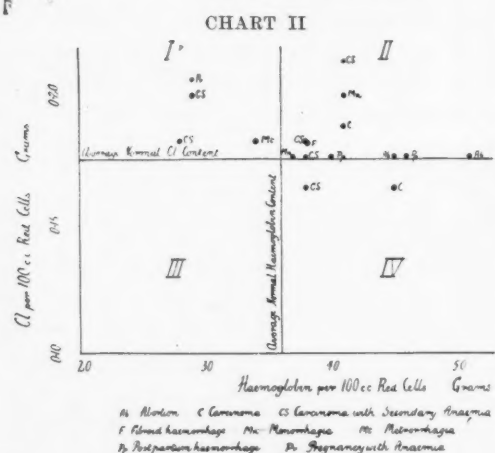
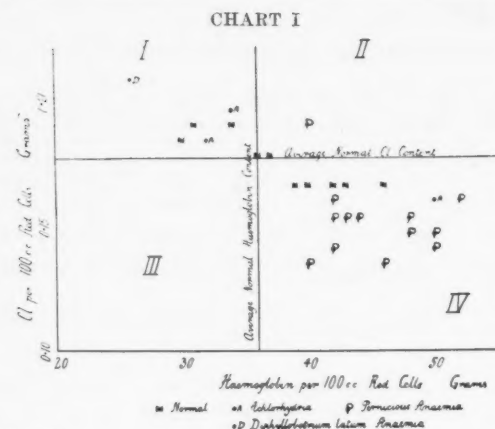
DISCUSSION OF RESULTS

In pernicious anæmia, and in the anæmia associated with *Diphyllobothrium latum*, it is

generally recognized that the chemical blood-picture (excluding chlorides and hæmoglobin) shows no marked deviation from the normal. The chloride and hæmoglobin figures for these conditions may therefore well be contrasted with those for normal individuals. They are plotted in Chart I, which includes also the results for the three achlorhydria cases, showing no other definite abnormality. In order to classify the results, lines have been drawn in the chart for the normal average cell-chloride-chlorine value, 0.176 gm. per 100 c.c. cells, and for the normal average cell-hæmoglobin value, taken as 36 gm. per 100 c.c. cells, and the four divisions so created labelled I to IV.

The mean figures for all our normal cell-chloride values in which the determinations were regarded as perfectly satisfactory are: for 16 males, 0.173; and for 11 determinations on 10 females, 0.179. These suggest no significant difference between the sexes, and the mean figure 0.176 gm. per 100 c.c. has been taken. These determinations are all on young adults, and we have no data yet available to show the degree of constancy of cell-chloride with increasing age.

We have only carried out hæmoglobin determinations on 8 males and (two determinations at different times) on 1 female. The mean figures are 38.5 and 35 gm. per 100 c.c. cells. From the values of Osgood³ for cell volume and hæmoglobin in whole blood for 137 young



males, the corresponding mean is 35.1 grm.; and from his summary of the reliable data of previous work (average cell volume in 23 males measured by Brown and Rowntree, and by Gram and Norgaard, being 43.9, and the average hæmoglobin content for 70 males by different observers being 16.27 grm.) the mean for these earlier figures is 37.1. Osgood and Haskins' figures⁴ yield the mean 33.4 for 100 young normal females, and similar calculations from previous figures the mean 37.0 based on far fewer measurements. (All these cell-volume values apply to blood taken with oxalate in which slight shrinkage occurs.)

These values cannot be properly weighted, since certain of them are calculated from cell-volume and hæmoglobin figures, not ascertained for the same series of individuals. Taking the simple means as approximately true, they are for males 36.9 and for females 35.1, and since these figures only show a slightly significant difference for the sexes, the average hæmoglobin content per 100 c.c. of normal blood erythrocytes cannot be far from the figure 36 grm. This also only strictly applies to young adults, and, so far, insufficient statistics are available to exclude possible slight variation with age.

In Chart II are plotted the cell-chloride and hæmoglobin values for the cases of Table III, secondary anæmias associated with various conditions. It is at once evident that the distribution about the lines of mean chloride and hæmo-

globin contents is quite different in the two figures. The chloride values in the secondary anæmias are almost all greater than the mean figure, but the hæmoglobin values show no definite grouping.

On the other hand, while the normal values in Chart I occur within the limit of error, either in the first or fourth division of the figure, with one exception all the pernicious anæmia figures occur in the fourth division, in which the cell chloride values are below average and the cell hæmoglobin values are above average, and half of them more than 25 per cent above the average. The single case of anæmia from *Diphyllobothrium latum* occurs in the first division, with a very low value for hæmoglobin, and a high chloride value.

The question at once arises, is there any significant connection between the cell-chloride and hæmoglobin values, or is such a distribution as that in Chart I accidental? Cell-chloride values depend on a number of factors, of which the most important are the degree of constancy of the pH of the cells, the carbon dioxide tension in cells and plasma, and presumably the concentration of chloride in the plasma as a function of the total osmotic pressure.

While our measurements were made so far as possible under constant conditions, with venous blood, unaffected by digestion, and kept from contact with air, yet our data are insufficient to allow the assumption of constant carbon dioxide tension, nor have we any means of ascertaining the effect of change of concentration of plasma chloride upon that of cell chloride. Further progress towards the solution of this problem calls for more thorough experimental examination than we are at present able to carry out, and the study is now further hindered by the almost complete absence of pernicious anæmia patients available for examination on account of the striking efficiency of liver treatment.

The envelope of the red blood cells is impermeable to cations (potassium, etc.) and to hæmoglobin. Any definite volume of cells has its basic ions (chiefly potassium) almost neutralized by hæmoglobin, and chloride, phosphate, and bicarbonate ions, to a pH value of 7.3 to 7.4. Under conditions so stabilized that total base, pH, and bicarbonate are fixed quantities, a change in hæmoglobin must be balanced by a definite change of opposite kind in the combined chloride and phosphate content. The establishment of a causal relationship between hæmoglobin and chloride concentration obviously will at least involve consideration of all these factors.

SUMMARY OF RESULTS

In pernicious anæmia the hæmoglobin content of a given volume of red blood corpuscles is invariably above the average normal value, and usually much above this value. On the other hand, the chloride content is almost always below the average normal value, suggesting that a causal relationship may exist between these two constituents.

In the secondary anæmias the chloride content is usually above the average normal value, but all variations of hæmoglobin value are found.

In a single case of anæmia from *Diphyllobothrium latum* high chloride and very low hæmoglobin values were found.

Our thanks are due to many of the attending physicians of the Winnipeg General Hospital for the permission to examine patients.

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HOSPITALIZATION IN PERNICIOUS ANÆMIA*

BY EGERTON L. POPE, B.A., M.D., C.M., M.R.C.P., (LOND.),

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IT is a regrettable fact that patients suffering from pernicious anæmia do not come under hospital supervision until their disease has made very considerable progress. Naturally, the most cogent reason for this is the insidious onset that characterizes the great majority of cases. The symptoms at first are as a rule not very remarkable, and thus the patient becomes used to them and accepts them. It is a matter of wonderment that some patients first come under systematic treatment with a red-cell count below a million, and yet giving a history of having carried on their occupations more or less efficiently during the evolution of their malady. During this period there may have been a perfunctory blood-count or two, a diagnosis of anæmia, and a course of ambulatory treatment, mostly medicinal, that had little, if any, real influence upon the condition. It has been said that the incidence of pernicious anæmia is to a large extent dependent upon the keenness of the profession in the community. This, of course, signifies that many cases exist without being effectively studied, without having even a blood-count, and the form of treatment is usually a hastily written prescription for a bitter tonic, given to offset a minor complaint, such as loss of appetite or that "tired feeling." At

length, however, the symptoms become sufficiently urgent to induce the patient to enter hospital.

Pernicious anæmia is one of several chronic diseases that should be regarded as demanding at least a month's hospitalization. During this time the diagnosis becomes accurately defined, the patient becomes adjusted to the necessity of rest and therapeutic environment, the diet and the treatment become adjusted to the alimentary, metabolic and excretory needs of the case, and, not of least importance, the patient undergoes an education in the way of living, with a view to adopting an optimum regime for the future of his earthly career.

The patient with a tentative or provisional diagnosis of pernicious anæmia, having been admitted to hospital, it is the primary duty of the attending physician to proceed to establish the diagnosis as far as possible beyond all reasonable doubt. It has been pointed out already that there are several conditions that may be confused with this disease, even in the presence of a blood-picture very strongly suggestive of pernicious anæmia. Consequently certain preliminary routine procedures are required in order to exclude these maladies. The first and most important is the taking of a careful history and the making of a careful physical examination,

* Read before the Edmonton Academy of Medicine, March 7, 1928.

in the process of which the following points should be carefully noted:

1. Evidences of focal infection in the teeth, tonsils, sinuses, gall bladder, lungs, pelvis of kidneys, prostate, bladder, bones, joints and skin. In the female the uterine adnexa should be studied by appropriate examination, and the breasts should be carefully scrutinized.

2. Evidences of internal ulceration leading to repeated cryptogenic hæmorrhages that might induce profound secondary anæmia.

3. Evidences of internal neoplasms, causing either hæmorrhages or toxic hæmolysis. A rectal examination is essential.

4. Evidences of abnormal heart-action, respiratory function, or abnormally palpable abdominal viscera, especially the spleen, liver and kidneys.

5. Evidences of neurological disorders, pointing to such conditions as postero-lateral sclerosis and lead poisoning.

6. The weight.

In a word, the history and physical examination must be absolutely complete if we would avoid the embarrassment incidental to the later discovery of an important abnormality that might give an entirely different aspect to the case. Incidentally, one should never forget to keep a vigilant eye and receptive ear for evidences of a drug-habit such as morphinism.

Having now completed this phase of our diagnostic study, certain routine laboratory procedures are indicated.

The first of these, naturally, is a study of the blood, and the house physician or technician is instructed to take blood for the following determinations:

1. Blood-count, with differential red and white cell count.

2. Red-cell fragility with hypotonic salt solution.

3. Clotting and bleeding time.

4. Blood Wassermann.

5. Blood chemistry: Quantitative examination for urea, non-protein nitrogen, creatinin and sugar.

6. Icterus index and Van den Bergh's test.

7. Blood culture.

8. Price-Jones' blood-cell distribution curve.

The object of this laborious and rather formidable procedure is to exclude as far as possible evidences of secondary anæmia, leuk-

æmia, splenic anæmia, hæmolytic jaundice, hæmophilia, syphilis, nephritis, diabetes and subacute infective endocarditis, any and all of which may resemble, superficially at least, the clinical and hæmatological picture of pernicious anæmia.

The second laboratory procedure is a study of the urine for evidences of nephritis or diabetes, either of which diseases may give a clinical aspect not unlike that of pernicious anæmia. In addition to the routine analysis, it is advisable to take functional tests, the two important ones being the Mosenthal and the phenolsulphonethalein. Incidentally the urine should be examined for indican and urobilin.

The third laboratory test of importance is that of the fæces. After a protein-free, green-vegetable-free diet of two days' duration, the stools should be examined for gross and occult blood. The previously mentioned rectal examination will exclude the question of hæmorrhoids. The stools should also be examined for intestinal parasites and their ova, also for *amæba* and *bacillus of dysentery*, and for *bacillus tuberculosis*.

The fourth procedure is a combination of clinical and laboratory procedures, the fractional gastric analysis, for the determination of the presence or absence of achlorhydria and achylia gastrica. The stomach-washings should be examined for evidences of cancer, in the form of lactic acid, pus and blood, and Oppler-Boas bacilli.

The fifth procedure is duodenal drainage, for the purpose of determining a gall-bladder infection, or a blood flow from a duodenal ulcer, or the presence of duodenal parasites such as *Lambia intestinalis*. In pernicious anæmia, the duodenal contents show abnormally large amounts of urobilin and urobilinogen, indicating excessive blood destruction.

The sixth procedure is the determination of the basal metabolic rate. Some cases of myxædema may show an anæmia akin to the borderline "pernicious" type. A low basal metabolic rate, -20 to -40,—in association with a typical history of progressive mental lethargy, and the characteristic physical findings, will settle the doubt, except in rare cases where the two conditions may co-exist.

Finally, the pulmonary and the alimentary

conditions, both in symptomatology and laboratory findings may require an appeal to the radiologist. A bronchiectasis, a lung abscess, or a neoplasm may be discovered in the thoracic films. A gastric or duodenal ulcer, gall stones, or alimentary neoplasm may be revealed by the barium series.

In view of this array of diagnostic methods, any or all of which may be required to establish a working diagnosis, it can readily be seen that hospitalization is of the utmost importance, if for diagnosis alone. Yet, it is of no less importance for the purpose of effective treatment. Such treatment may be summed up in this manner:—

1. Rest in bed, with ordinary nursing routine.
2. High vitamin-diet, with a minimum of fat, *i.e.*, very little butter or fat bacon.
3. Sunlight and fresh air.
4. Liver extract in suitable dosage.
5. Dilute hydrochloric acid during meals, (mm. xv-xxx t.i.d.).
6. Simple laxatives, enemata, and other symptomatic measures as indicated.
7. In the case of men, the question of tobacco may be an important one, and strict injunctions must be carried out in this respect.
8. The judicious and thoughtful removal of foci of infection, if present and demonstrable.
9. The administration of blood-transfusion if improvement is not promptly forthcoming by the preceding measures. Indeed, the liver-treatment is so encouraging that the number

of blood-transfusions will likely be greatly reduced.

Once a week the patient should be weighed and should have a blood-count. Rest in bed should be continued for at least a fortnight and longer if the blood-count does not improve to a very considerable extent, and the general symptoms do not abate to an encouraging degree.

When the point is reached where it is thought advisable to allow the patient to get up, short walks in the open air and sunlight may be allowed after a few days of intermediate chair-rest.

Once a remission is established, the patient may be discharged with a warning to continue at home the regime that has been followed in hospital, replacing the liver extract with one-half pound of cooked liver, and gradually reducing the amount as the blood-picture nears the normal. The patient should report once a month, if expedient, for the purpose of having a blood-count and general examination.

Provided such a course is followed in pernicious anæmia patients, it is hoped that with the new treatment, an entirely new prognostic aspect may be established and a large percentage of patients may resume a modicum of economic and social activity. Moreover, many patients, thought to have pernicious anæmia, will be found to be suffering from an entirely different disorder and appropriate treatment will be instituted.

Health Examinations and Physician. — J. Rosslyn Earp, Yellow Springs, Ohio, relates his experience in making examinations of all applicants for admission to Antioch College. These examinations are made by the applicant's family physician. When the forms are returned by the physician they are carefully read and a report is made both to the admissions committee and to the personnel department which assigns industrial work. The form is then filed, and nobody, not even the president of the college, is given access to these files. Soon after he or she reaches college, the freshman comes to Earp's office for an interview. The purposes of this interview are to follow up the observations of the physician, reinforce his recommendations, insure that the student is well adjusted to his new environment, and engage his co-operation in the care of his health. The most astonishing deficiency

in the returns is the failure of the physician to make any positive health recommendations. In the last 100 reports received, however, there were seventy-two in which no positive advice had been given by the physician. These seventy-two students included some who had never been vaccinated, and others who were evidently undernourished or suffered from hay-fever, headaches, constipation and other remediable defects. Even when advice has been given, it frequently has failed to cover all the complaints registered in the form. Earp says that the main defect in periodic health examinations, as they are conducted to-day, lies in the fact that the examining physician is still more interested in advanced symptoms of manifest disease than in those lesser disorders of function which call not for curative treatment but for prophylaxis.—*J. Am. M. Ass.*, Feb. 4, 1928.

A REPORT ON THE THERAPEUTICALLY ACTIVE PRINCIPLE FRACTION OF CRUDE COAL-TAR*

By W. R. JAFFREY, M.B.,

Hamilton

THE use of crude coal-tar in dermatology is of such proved value, but its application so colorful, that some way of purification to do away with the carbon and make a more pleasant application, without sacrificing its activity, would be labour expended in a worthy cause. The separation of the therapeutically active part, therefore, by chemical methods, seemed to be a logical study and the fractionation was undertaken by the chemist of the Hamilton By-Product Coke Ovens, the crude tar from which was found to possess the therapeutically active part.

The tars chosen were of the types recovered in the by-product coke ovens, which have an approximate specific gravity of 1170. The processing is high temperature, but these tars are removed from the coking chamber as rapidly as possible, having little contact with the hot silica brick work and incandescent carbon. Tars of the specific gravity of water and a little higher are "low temperature" products, and consist chiefly of non-aromatic hydrocarbons and tar acids. Tars having a specific gravity of approximately 1200 are "horizontal retort" tars, and have been exposed to the hot brick work of the retort tops, giving high naphthalene and free carbon contents. The white crystals which form on the surface of crude coal tar, when stored in a cool place, are naphthalene, which makes up about 20 per cent of the total tar, and is soluble in ether, one part in three.

Owing to the range in boiling points of the various components of tar, distillation is a convenient means of separation, and was used in this investigation. A separation was made by collecting the distillate to 210° C., and leaving the semi-solid black residue in the still. Another sample was distilled to 300 degrees; this distillate was colled to remove the solids, naph-

thalene, etc. A portion of this was redistilled, to recover the fraction coming off between the temperatures of 170° and 210°; thus discarding the benzol, toluol, etc., below 170 degrees, and obtaining the tar acids, phenol, crysol, etc., with saturated and unsaturated paraffin oils. Another cut of from 210 to 230 degrees removed the remaining naphthalene; and 230 to 270 degrees removed the heavier tar oils with anthracene. The oil from the 170 to 210 degrees cut, with the naphthalene removed also, was treated by caustic-soda washing, and the tar acids removed. In this operation a reaction takes place and pyridine is formed, producing a very characteristic odour.

All these fractions were then tried out therapeutically, on, for the most part, cases of so-called infantile exudative dermatitis of both the seborrhœal and the sensitization or flexural types, and on psoriasis, treating various areas with the different preparations, and carefully noting the results. Some of the fractions seemed to have no therapeutic value, and it developed that those supposed to contain the largest percentage of tar acids were the most active. Naphthalene itself was found to be inactive, and as much as possible was removed.

Tars from different sources were distilled; that from the local by-product ovens proved to be the most efficient. One distillate was made by the "lead bath" method, so-called "low temperature" work. Another was prepared from a rough cut from a five ton still, and was fractionated to give our useful range of distillation products, but it was not active to the same degree.

After nearly a year's investigation, it was decided that the active fraction is contained in the distillate from the local tar, and comes off between the temperatures of 170 and 300 degrees, and that the naphthalene is not useful. This is crystallized out by cooling, and may take other products with it, but leaves a dark

* Read before the Canadian Section of the British Association of Dermatology and Syphilology in Toronto, March, 1928.

amber oil, about 15 per cent of the total tar, which, when used in 4 per cent dilution in white vaseline, either alone or in conjunction with thirty grains of white precipitate, or one dram each of starch and zinc oxide to the ounce, equals the activity of crude coal-tar in similar combinations.

One point brought out was that a very fine adjustment of the distillation was not necessary, and that the proper distillate could be obtained only by distillation in small quantities.

When we were well along in this work, an article was published by Nelson on "The separation of the active principle by steam distillation," and our chemist was of the opinion that the method we were using was superior. This oil has now been in use about six months, and our methods of manufacture

are standardized. It can be procured according to these specifications.

The Hamilton By-Product Coke Co., of Hamilton, have consented to produce this product, and it can be procured from Mr. A. E. Drewery, Phm.B., of Hamilton, in ounce bottles. It has been used by me in about 4 per cent strength, or 20 minims to the ounce, combined with white precipitate for psoriasis, and with zinc oxide and starch for exudative, irritant dermatoses.

My thanks are extended to Mr. E. Burrough, formerly chief chemist of the Coke Company, and now in the government service at Ottawa, who made the separations, and supplied the chemical data; and to Mr. D. Nanson, who has carried on the work, and is at present preparing the product.

THE OCCURRENCE OF A RAISED BASAL METABOLIC RATE IN NEW GROWTH WITHOUT HYPERTHYROIDISM*

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FROM a review of the past ten years' literature, the occurrence of a raised basal metabolic rate associated with malignancy would seem to be of a very infrequent occurrence. In a report of the basal metabolic rate findings in 8,614 subjects by Boothby and Sandiford¹ there were 2,417 cases, where there was no thyroid disorder. Included in these 2,417 cases there were twenty cases of malignancy. Fifty-five per cent of these twenty cases had a basal metabolic rate within plus or minus 10 per cent of the Sage Standard. Twenty per cent, that is four cases, had a basal metabolic rate above plus 20 per cent.

The present report concerns a case of malignancy in which the basal metabolic rate was consistently elevated, there being no evidence of any thyroid disorder, and the pulse rate and body temperature remained normal.

CASE REPORT

R. S., a female of 47 years, was admitted to the Royal Victoria Hospital on March 6, 1924. Her com-

* From the McGill University Clinic, The Royal Victoria Hospital, Montreal.

plaints were (1) swelling and tenderness of the abdomen, (2) belching of gas, and (3) weakness.

Present Illness.—Until November, 1923, usual health had been maintained. Then she noticed a fullness in the epigastric region. As the fullness increased, tenderness developed with belching of gas. There was no vomiting. Gradually the abdominal swelling became marked and loss of weight followed.

Personal History.—On November 1, 1918, the right eye had been enucleated for a secondary glaucoma due to a choroidal melano-sarcoma.

Family History.—Negative.

Present Condition.—The general nutrition was poor, there being marked evidence of loss of weight. The abdomen was moderately distended. The mucous membranes were pale. There was no glandular enlargement. The thyroid was not palpable. The chest and lungs were negative except that the lower border of the right lung was slightly higher than usual. The pulse was regular, 72 per minute, and the blood pressure was systolic 138, and diastolic 92, mm. of Hg. The heart was of a normal size. The liver was greatly enlarged, its lower border almost reaching the brim of the pelvis. Its anterior surface was smooth and tender to palpation, especially about the level of the umbilicus. The spleen was also just palpable and firm. There was no evidence of free fluid in the peritoneal cavity.

SPECIAL EXAMINATIONS

Blood.—Red cells, 4,380,000 per c.mm.; white blood cells, 9,600 per c.mm.; hemoglobin, 75 per cent.

Urine.—The colour varied from a dark yellow to a turbid amber; the reaction was acid; varied in specific gravity from 1008 to 1012; contained a trace of albumen but no sugar. Melanin was always present in large

TABLE I.—THE BASAL METABOLIC RATE

Date	Pulse Rate	Resp. Rate	Surf. Area	Oxygen Consumption (S.T.P.D.)	Basal Metabolic Rate	Remarks
1924	per min.	per min.	sq. meters	c.c. per min.	per cent	
March 18th....	80	20	1.54	278.4	+45.3	First test.
" 20th....	78	20	1.54	276.6	+44.4	
" 21st....	78	20	1.54	265.8	+38.6	
" 22nd....	76	20	1.535	267.8	+40.2	
" 24th....	76	20	1.545	261.1	+37.8	
" 25th....	76	20	1.54	268.5	+40.3	
" 27th....	76	20	1.54	259.9	+35.8	
" 28th....	76	20	1.54	263.1	+37.5	
" 29th....	76	20	1.545	272.1	+41.7	
" 31st....	72	20	1.55	276.9	+43.6	
April 1st....	76	20	1.55	283.7	+46.9	
" 2nd....	76	20	1.55	273.4	+41.9	
" 3rd....	76	20	1.545	275.8	+43.6	
" 9th....	
" 11th....	88	20	1.55	314.0	+62.8	Lugol's iodine soln. min. 5, t.i.d.
Average.....	77	20	1.544	274.0	42.8	

quantities. The microscopic examination showed a few hyaline casts and leucocytes.

Blood Wassermann.—Negative.

Blood.—Urea nitrogen: 9.8 mg. per 100 c.cm. Plasma chlorine: 382 mg. per 100 c.cm.

X-Rays.—*Chest:* The heart and aorta appeared to be normal. The right diaphragm was moderately elevated. *Barium Meal:* Negative findings.

Diagnosis.—Melano-sarcoma of the liver which was secondary to the primary lesion arising from the choroid of the right eye.

The basal metabolic rate findings are shown in Table I. Fourteen determinations throughout the hospital stay gave a uniformly raised basal metabolism, the average result being +42.8 per cent, with a maximum and minimum range of +62.8 and +35.8 per cent, respectively. At all times, except upon April 11th after the iodine administration, the pulse rate remained practically constant. Why the basal metabolic rate rose appreciably following the iodine administration is not known.

DISCUSSION

It would appear that the increased oxygen consumption was due to the rapidity of multi-

plication and growth of the tumour cells. That such local increased metabolism had no effect upon the pulse rate is quite definite. The maintenance of a normal body temperature was effected by the increased heat loss. In the same way as the basal metabolic rate in leukæmias is elevated in proportion to the white cell count, it would be logical to assume that rapidly multiplying localized tissue cells can account for an increased oxygen consumption.

SUMMARY

A case of melano-sarcoma with extensive involvement of the liver which had a consistently elevated basal metabolic rate is reported. This increased oxygen consumption was independent of any alteration in the pulse rate. There was no evidence of any thyroid disorder.

REFERENCE

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Clinical Significance of Sedimentation Test.

After the observation of nearly 650 cases in which 1,660 readings have been made before and after operation, John Osborn Polak and Donald G. Tollefson, Brooklyn, have come to regard the sedimentation test as the best means of diagnosis in latent infection. It is more sensitive and has more value than the leukocyte count and other

laboratory tests. The test has also been found to be an aid in prognosticating post-operative complications after the first week, and as a criterion for discharging patients. Finally, a low reading means infection and a high reading means that infection can be excluded, for "sedimentation never lies."—*J. Am. M. Ass.*, Jan. 21, 1928.

THE RELATION OF THE DEPARTMENT OF PUBLIC HEALTH
TO THE PROFESSION*

BY HARRIS MCPHEDRAN, M.B. (TOR.)

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THIS question has arisen at this meeting to-night as a result of the proposed method of administration of toxoid to the children of this city free of charge by school physicians. The committee appointed to investigate this matter were of opinion that this procedure was not justifiable, and so reported to the council, with the recommendation that this matter be brought before the Fellows of the Academy that their views may be obtained.

This question of the administration of toxoid seems only to draw attention to the larger one, that of the relation now, and probable relation in the future, of the public health department to the profession in this province. At present the practice of medicine is, in general terms, carried on by two bodies. (1) The Public Health Service, dealing with matters pertaining to the welfare of the public at large, as sanitation, control of infectious diseases, etc. (2) The medical practitioner, general, specialist and consultant, dealing with the health of the individual. In many ways and in many places their fields overlap, and in not a few ways that of the practitioner is being gradually intruded upon by the medical officer of health, as for instance, your committee believes, in the administration of toxoid; and, in my judgment, in regard to venereal and baby clinics free to all, and large hospital clinics free to at least too many, where no effort is made to discriminate between those who can and those who cannot pay their way. At this juncture it might be well to remind ourselves of some of the powers of the Department of Health and its medical officers here in Ontario, in other sections of the Dominion, and briefly in some other countries.

There is in Ontario a Minister of Health, a Deputy Minister of Health, and Medical

Officers of Health in cities, towns and districts organized and unorganized, together with an ever increasing number of nurses of public health, all these co-operating and subject to government control. The powers conferred on the various officers of health are very wide.

On page 26, Sect. 62 of the Public Health Act of Ontario we read: "The medical officer of health, or a legally qualified medical practitioner appointed by him in writing for that purpose, may enter in and upon any house, out-house or premises, in the day time, for the purpose of making enquiry and examination with respect to the state of health of any person therein, and cause any person found therein, who is infected with any communicable disease, to be removed to a hospital or some other proper place."

On page 36, Sect. 87 we read:—"Subject to any regulations made under the Department of Education Act, the local board, upon such terms and conditions as may be agreed upon with any public or separate school board, shall provide medical and dental inspection for the pupils in the schools of the board and render such other services relating to the health and well-being of the pupils as any such regulation may require and as may be directed by the Minister of Health." These are very wide powers, and none need be under an illusion as to Dr. Hastings' power to give toxoid in the way proposed if he chooses. However, while we have as at present capable doctors as our chief executives, we are reasonably safe from any drastic moves which will work to the disadvantage of the private practitioner, but should we get a layman as Minister of Health we could not hope for as much sympathy or help for many obvious reasons.

In Great Britain they have a scheme for treating the poorer people under the panel

* Read at a special meeting of the Academy of Medicine, Toronto, October 25, 1927.

system. The doctor, a civil servant paid by the government, looks after those on his panel without charge to the patient, and it is said the scheme is working to the advantage of all.

In Norway¹ there is what is known as socialized medicine. By means of the "Sick Insurance Act" every one whose income is less than 6,000 kroner a year is insured and automatically entitled to medical services for all conditions free of charge. These services are arranged for by "Krydsyge Kasser," (corresponding to our sick benefit societies) by contract with the different doctors in a community. A list of all medical men under contract is published and lay members of the society entitled to medical services may choose what doctor they wish. Specialists and consultants also have a definitely fixed schedule. Care is taken by the Norwegian Medical Association, really a union to which every doctor belongs, that contracts for fees are not too low, and it is said the law is working well with patients and doctors.

Now let us turn to Alberta, where a farmer government is in power, and where there is a lay Minister of Health. Owing to pressure from the farmers of this province and the inaction, I am informed, of the medical profession in Alberta, considerable advance has been made by the government towards creating a state service.

The government, which has in the past sent a medical team in the summer to outlying districts, announced by radio this past summer that it was prepared to send such a team composed of a doctor, dentist and nurses to any district requesting them. This team would, the people were informed, remove tonsils, adenoids and teeth from children at a cost far below that which would be incurred under ordinary circumstances, and would come to any locality that desired it,—all this be it noted without any consideration of the practitioners in any of these localities.

Further I am told there are regulations whereby:²

(a) An autopsy is automatically performed by the state coroner on any case dying within three days after surgical operation.

(b) Any operative case is considered a surgical death if such occurs within one month after operation.

(c) All material removed at the time of

operation must be sent to the provincial pathologist for section and report.

These last three regulations I believe are in the right direction, as they will tend to stop unnecessary, ill-timed surgical interference, a menace at all times in all countries at present, and the one thing above all, I believe, which will do more than all else to drive us to an increased number of restrictive government measures, unless high-minded well qualified surgeons especially, and the profession generally, seek to set their own house in order. Nor are physicians and general practitioners blameless. The various cults are a burning tribute to a many-sided stupidity in teaching and practice, and one need only mention, to condemn, the use of x-ray, radium, and diathermy by those whose only knowledge and training is derived from the enthusiastic agent of an aggressive surgical supply establishment, whose chief care is to make dividends for its stock-holders.

These and many other wrongs and abuses within our own ranks we should be careful to adjust, if we desire, (perhaps we do not), to avoid state medicine. In any event we should maintain the highest ideals in all branches of practice, and see to it that those claiming to be specialists and consultants are properly qualified to act as such. This is I believe being done in Alberta. Moreover, it seems that it will be necessary to find ways and means whereby, once in five years at least, everyone in the profession in this province shall be under obligation to take a "refresher" course. Could not this work be undertaken by the Ontario Medical Council, which has wide powers and considerable assets, both of which might be augmented if necessary to accomplish this? In this way the magnificent work now being done by the Ontario Medical Association through general and local meetings might be more effective.

The alternative to this, it seems to me, is some form of a state service in medicine and of this there are many advocates. After some time spent in the army one can see many advantages in such an organization, men working for the most part harmoniously in groups and doing I believe far better work than men working single-handed can ever hope to do. And some such organization carried into civil life would

seem to be advantageous, in that the work might be better organized, yearly health examinations made, complete life records kept of all, outlying districts properly cared for, sufficient equipment provided for the benefit of all, members of the profession kept abreast of the times by post-graduate courses, and highly trained skilful men of experience chosen as specialists and consultants.

But even in the army there were disadvantages of which two seemed of paramount importance. (1) A bureaucratic and often stupid administrative executive. (2) A very marked tendency on the part of medical officers to treat men only as cogs in the machinery, and not consider them as living souls.

Moreover, we have to remember that the civil population would not submit to discipline to the degree that obtained in the army, and might be inclined to insist on attention and treatment both inadvisable and unnecessary, just because it was free and they were entitled to it. Most people too want to choose their doctor. This might not always be possible under some form of state medicine. Above all they want to be treated as sick people with personalities, and not just cases of this or that. May there not be cause for fear that doctors with the future more or less assured would adopt this latter attitude toward the patients

assigned to their care and not give that personal careful attention which is prompted by the expectation of personal attachment, gain, and advancement in a chosen profession?

I discussed these problems with a lay friend of mine recently, and he cited the teaching profession (really a civil service) as an instance where assured income and position did not have a deterrent effect on their work, but there one has to remember their work is done in comparative comfort, and their clientèle is under more or less discipline and supervision. It is to be remembered too that most of those who go into the teaching profession do not intend to stay in it, quite a different state of affairs from the medical profession.

Might it not be well, however, to have a committee of this Academy investigate the conditions under which the practice of medicine is carried on in the leading civilized countries of the world and report in due time? In this way as evolution in the practice of medicine takes place, as it is bound to do, we shall be found as a profession, organized, informed, ready to help and let us hope, direct any desirable changes.

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2. ROUTLEY, T. C., AND BAKER, J. O., Verbal communications.

Studies on Digitalis in Ambulatory Cardiac Patients—According to Harry Gold and Arthur C. DeGraf, New York, digitalis is employed in the cardiac clinic primarily for the purpose of preventing heart failure or the recurrence of heart failure in the sense in which they have used the term. In this respect the task in the clinic is different from that in the hospital. The problem this presents can be studied properly only by direct observation of the ambulatory cardiac patient, in which case the theory and practice derived from the study of acute heart failure in the bedridden patient are not satisfactory guides. Since these studies cover long periods of time, a method has been adopted in the clinic to obtain constancy in the preparation of digitalis in order to be able to distinguish changes in effects that may be due to altered condition of the heart from those due to unknown variations in different specimens of the drug. A study of four specimens of digitalis did not give any indication of deterioration by the cat method when the powdered digitalis leaf was kept for a period up to five years, nor perceptible loss in clinical efficiency during the

periods of from two to nearly three years in which they were used. It is commonly stated by physicians that certain preparations of digitalis are more readily tolerated than others. This has led to needless shifting from one to another preparation of the drug to obtain better therapeutic effects or to avoid disagreeable or toxic symptoms, rather than to analysis of the circumstances attending the failure to obtain in any given case the desired results. In nearly all such cases, provided an active specimen of digitalis has been employed, the failure to obtain the desired effect will be found to be due to factors not overcome by other preparations of the drug, although isolated, uncontrolled observations may seem occasionally to point to the contrary. As already indicated, in the five years during which more than 500 patients were treated with four different specimens of active powdered digitalis leaf in the form of compressed tablets, there was not a single instance in which it was found necessary for any reason to resort to any other form of digitalis medication.—*J. Am. M. Ass.*, March 31, 1928.

USES AND ABUSES OF THE X-RAYS*

BY T. L. GRAY, M.D.,

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THE human animal is in most respects "the same yesterday, to-day and forever." He is divided into two classes: the credulous, over zealous and enthusiastic about anything new; the dour, stubborn, and "doubting Thomases."

In x-ray work, these two classes are found in our hospitals, as well as amongst men in private practice. Both are wrong. Both are dangerous, and, as in everything else, the sane middle course is chosen by comparatively few. When one listens to members of the first class, apparently believing that nearly everything from a fracture of a long bone to the most obscure functional trouble can be diagnosed by the use of the x-rays, and that practically every known disease can either be cured or retarded, the question as to their sanity arises. We have heard patients say that a certain doctor was unable to make a diagnosis, so he sent them to be x-rayed; both doctor and patient very often believing that the x-ray findings would be positive and conclusive evidence. Nothing could be more erroneous and disastrous to both patient and doctor, because in many cases the roentgenogram is only a link in the chain of evidence forged by the clinical story, physical examination, laboratory findings, etc.

A few of the outstanding valuable uses of the x-rays in diagnosis may be mentioned. Fractures and dislocations were the horror of medical men before the advent of the x-rays. With the assistance of this agent, the surgeon is now relieved of much uncertainty and responsibility in these cases, and the chances are minimized of the patient becoming the victim of unnecessary permanent deformity, or of paralysis from manipulation to elicit crepitus, or of the train of evils liable to follow the manipulation used in making a diagnosis.

In many chest cases, we all know that a positive diagnosis is sometimes made by the x-rays when all other methods fail, and in others the diagnosis, made by other means, is

confirmed. Cases of pulmonary tuberculosis are not at all infrequent where roentgenograms of the chest would show the presence of the disease in its earliest stage, long before any other method of diagnosis. For example, I saw such a case about a month ago and the patient complained of nothing except general malaise. Mediastinal lesions are simply past finding out by any other method. The differential diagnosis between an aneurism of the aorta and lymphosarcoma is another illustration. Metastases, appearing on a roentgenogram of the chest, sometimes give a positive clue to the type of pathological lesion existing in some other part of the body.

When we consider the fact that about 96 per cent of organic stomach and duodenal disease is diagnosed by x-rays and that about 70 per cent of gall bladder lesions are by the same means easily diagnosed, we cannot help but regard this agent as spectacular. In cases of kidney and ureter calculi, the only positive diagnosis is made by the x-rays, and the same thing is true in some other conditions,—hydronephrosis, tuberculosis, etc.

In the examination of the accessory nasal sinuses, with the latest facilities, as for instance the Grainger head rest, and proper technique, not only pus and granulations can be demonstrated but also hyperplasia of the sphenoidal sinus.

In mastoid cases, a roentgenogram is valuable to the surgeon, not only for diagnostic purposes but to show the position of the lateral sinus.

Very few dentists to-day are willing to give an opinion on the conditions of the teeth and jaws without having an odontogram before them, because without it they know nothing about the condition of the teeth below the gum line.

In cases of intracranial pressure due to suspected growths the location is often positively indicated by ventriculograms.

Of course all are familiar with the value of the rays in locating foreign bodies.

* Read before the Huron County Medical Association, December, 1926.

These are some of the outstanding valuable uses. Many other examples might be mentioned, as for example, in hypertrophic and atrophic arthritis, bone cysts, osteosarcoma, which often can be diagnosed in no other way.

The abuse of x-rays is due to wrong technique or wrong interpretation, especially to the latter. It has been said, "Don't believe all that the roentgenogram says, nor all that the roentgenologist says that it says." We all know that patients have been sent to the operating table because some roentgenologist, in some instances not a medical man at all, diagnosed appendicitis, gall bladder trouble, duodenal ulcer, etc., when nothing of the kind existed.

There is no branch of medical work which requires so much careful conservative consideration as the interpretation of a roentgenogram, and the more one does of it, the more cautious he becomes. An interpretation should always be made by a medical man, who not only understands x-ray technique, but who has such clinical knowledge and experience as would qualify him as a consultant. Truly in this work "fools rush in where angels fear to tread." There is no such thing as an x-ray picture. Roentgenograms are *shadowgraphs* and simply the records of varying opacities through which the rays have passed, and are subject to the possibility of erroneous deductions because of the fact that they are shadows. Objects are visible only when they differ in density from their surroundings, and until one has become familiar with shadows produced on normal structures and is capable of taking into consideration all factors which can distort or create an idea of increased or diminished density, he should be thankful when his interpretation is not solicited. The value of a roentgenogram is in direct proportion to the ability of the man who made and interpreted it.

Roentgen ray diagnosis, as clinical diagnosis, in some cases is easy, in others difficult or impossible. It has been said that a roentgenologist should not be towed along by clinical symptoms; at the same time he must emphasize the great importance of his observations. He should never be afraid to say that he is uncertain or that he does not know, and in some instances he should be willing to wait and see whether or not the clinical picture will point in the same direction as the roentgenogram. When consulting text-books, remember they contain many errors because, at the present time, roentgenology is an imperfect science.

With all respect to able men who have been working in the field of x-ray therapy, after visiting a number of the outstanding hospitals in the United States, I am convinced that very little is known about the *modus operandi* of the rays on pathological areas and less on normal tissues, and that a great deal of harm is being done by reports of wonderful results published all too prematurely. As an example, articles have been written for years, and a detailed technique of treatment given in text books for psoriasis which has now been discontinued in the Massachusetts General Hospital. Such reports appearing in medical literature continually act as a stimulus to men who simply possess an x-ray outfit to treat promiscuously almost every type of disease known, with results that are either negative or harmful in the great majority of cases. We also know that disastrous results have followed months and even years after treatment had been discontinued.

The object of this paper has merely been to draw attention to the fact that the pitfalls in x-ray work are many, and that while this agent ranks with the greatest of recent discoveries, it is also a two-edged sword, and a most dangerous agent when abused.

Regeneration of Bladder Following Resection.—On the basis of their experimental study, Herman L. Kretschmer and K. E. Barber, Chicago, assert that extensive resection of the bladder is followed by the formation of a new bladder. The newly formed bladder fulfils completely the function of the old bladder in that it is capable of retaining the urine for

many hours and of discharging urine in the normal manner. Incontinence as a permanent complication does not follow even the widest type of resection. From the histologic picture and its close resemblance to the normal bladder, it would appear that the newly formed bladder is the result of regeneration.—*J. Am. M. Ass.*, Feb. 4, 1928.

MASKED MASTOIDITIS IN CHILDREN UP TO THE AGE OF TWO YEARS

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IT is only in the past few years that mastoiditis, of the type to be discussed, occurring in infants and young children, has come to be recognized. Nor are the reasons for this late recognition hard to find. The symptoms in the baby are not the symptoms in the adult; it is but rarely that the clinical local external signs are present; almost always the major symptoms manifest themselves in distant organs. Thus, the physician, focussing his attention upon these evident symptoms, passes by the true seat of the disease; and the specialist having in mind the classical picture of mastoiditis overlooks the new signs.

In a series of forty-five cases, treated by operation on the mastoid at the Children's Hospital and the Misericordia Hospital in the past two and a half years, 95 per cent were of the type to which reference has been made. There is no doubt that infection in the middle ear which arises in early infancy may have a profound influence on the general health of the child; many cases are seen in the hospitals where an acute otitis media gives rise to severe gastro-intestinal disturbances, with elevation of temperature and in some cases convulsions; and these secondary symptoms in the early stages may be relieved by opening of the ear drum and drainage of the middle ear. Now with regard to that type of case which goes on to the chronic stage and gives rise to spreading of the infection to the mastoid; these children become progressively worse; the fever which was present during the early stages may subside and run about normal or slightly above it; in the more severe cases, however, it remains elevated and ranges between 100° and 104° F.; leukocytosis is present generally. As absorption progresses, these children become extremely dehydrated, and as time goes on, if they are left untreated, they will die from toxæmia.

The number, considering the supposed rarity

of the disease in infancy, may surprise you. There are, however, factors operating in infancy and not in later life which might logically lead one to expect that the disease should be common rather than rare. ~~In the first place,~~ mastoiditis in both infants and adults is practically always secondary to infection in the rhino-pharynx, the infecting organisms reaching the tympanic cavity by way of the Eustachian tube. Now the infant, particularly the malnourished artificially fed infant, and those in crowded, poor, and unsanitary homes, are very prone to attacks of acute rhinitis and rhino-pharyngitis, much more so than an older child or adult. To put it another way, one may say that this class of infant is exposed to infection in the mastoid more frequently than in later life, and more frequently, too, than children of corresponding ages brought up in better surroundings. Again, the Eustachian tube in the infant is short and relatively widely open; there is, therefore, a broad avenue for infection to enter the middle ear. Thirdly, the tissues of the infant are more hydrolabile than the adult; they swell up to a greater degree from a lesser cause, so that the Eustachian tube may easily become blocked by inflammatory oedema. The presence, too, of hypertrophied adenoid tissue around the mouth of the tube in many cases, no doubt, exaggerates this blocking. Fourthly, the tympanic cavity, from birth up to about the third month, contains a myxomatous mass, and this no doubt provides a fertile soil for organisms which gain entrance to the cavity. And, finally, in the case of the infant lying almost constantly on its back, the tympanic cavity and its appendage the mastoid antrum form the most dependent portion of the upper respiratory tract, a sort of cesspool for excretions and exudates of the rhino-pharynx. With these facts before us one is surprised that mastoid infection is not more common than it is.

A brief description of the anatomy of the middle ear and mastoid of the infant may be desirable here. According to Politzer,¹ the tympanic antrum is the only pneumatic space present in the temporal bone of the new-born. He states, however, that it is not only relatively but absolutely larger than in the adult. The Eustachian tube, as already stated, is relatively shorter and wider than in the adult, and the mucous membrane lining it and extending into the antrum is very redundant.

This accumulation of tissue, especially when infection is present, extends through the aditus and fills the epitympanum as well as the mesotympanum. The blocking of these spaces is thought by Coates to be the cause of delay in perforation of the tympanic membrane during the early stages of the disease. With regard to the cellular development of the bone, there has been, and still is, in some quarters a great deal of controversy regarding the rationale of operating on so small and undeveloped a structure. Descriptions of the mastoid in the new-born are given to point out how under-developed the structure really is. Yet the difference between this and the development that has taken place by the fourth month is quite appreciable. As quoted above from Politzer, the antrum in the newborn is as large as in the adult, and one sees in many of these cases between the ages of four months and a year quite as appreciable a cellular development outside the antrum.

Absorption from this region is very prone to occur. The lymph-vessels of the middle ear are supplied by the deep cervical glands, the submaxillary, and the retro-pharyngeal glands. On the other hand, the lymph-vessels of the middle ear do not communicate with the mastoid glands on the planum mastoideum, which contains the lymph-vessels of the occipital portion of the scalp.

As pointed out by Coates,² blocking of the aditus may occur during the progress of the disease, leaving disease in the antrum after the middle ear has cleared up, and this accumulation of infected material may be sufficient to give rise to focal symptoms in the absence of local ear symptoms. Gomperz and Alexander believe that the infantile tympanic membrane is more resistant than in the adult, and as the folds of mucous membrane in the middle ear and attic prevent the early accumulation of a large

mass of infected material, pressure upon the drum with resultant necrosis and perforation is often much delayed. Other observers do not agree with this explanation. Alden³ believes that the failure of the infant's drum to rupture early is more often due to the relief of pressure by the evacuation of the purulent contents of the middle ear by way of the Eustachian tube. There is no doubt that both these factors play some part, because it is a fact that the drum membrane is very resistant and in many cases one observes this repeatedly when incising the membrane, and, as Alden explains, the drainage by the Eustachian tube has an influence. On the other hand, how often does one have to incise the adult membrane on account of its persistent resistance. It seems to me that individual peculiarities, or rather variations, in the anatomy of the parts concerned, together with the particular nature of the infection, are the factors that cause delay in perforation of the tympanic membrane in certain cases, both in infants and adults.

The investigation of all these cases has been carried on in co-operation with the Department of Pædiatrics. Generally, these children are admitted as pædiatric cases, as they exhibit symptoms remote from the ear. In many instances it is impossible to get a history of ear-trouble; if one is obtained it is generally indefinite and unreliable, for reasons which are obvious. One of the most important things to ascertain is the duration of the aural discharge, if this is present. If it is not, a careful examination of the ears will reveal the presence or absence of trouble there. I am convinced, especially after our experience of the past three years, that these cases can be definitely and positively diagnosed if they are gone into carefully. The indiscriminate opening of mastoids for the relief of intestinal intoxication, as has been advocated in some parts of the country, is to be deprecated. A diagnosis of mastoiditis can be made or ruled out, I think, in all cases. Some local signs or symptoms will be found to be present in the ear if the mastoid is involved, and these can be detected if search is made. A carefully taken history is first demanded, followed by a careful examination of the appearance of the tympanic membrane. If a history of otorrhœa lasting over a period of from three to five weeks is obtained with an exaggeration or lack of improve-

ment in the general symptoms, this alone may be reason enough for advising operation on the mastoid.

The general symptoms are those of gastro-intestinal intoxication. In the severer types there may be diarrhoea, loss of weight, dehydration, and rise of temperature, varying from normal to 104°. Changes in the diet and attempts to check the progress of the disease have been without avail.

Let us turn now to consider in detail some of the local signs mentioned above. When there is inflammation in the middle ear the tympanic membrane may assume a different appearance in each individual case; generally it is infected, the infection extending around the periphery and from its upper part downwards along the handle of the malleus. If there is bulging it is generally in the posterior segment. In some cases the membrane assumes a dull gray colour, and on incision a thin fluid pus will be evacuated. In others, there is a cloudiness and yellow discolouration; in others again there is only a slight variation from the normal, so that if the examination is made in a perfunctory manner the signs of an inflammatory action may be missed. There is generally swelling of the periauricular glands.

External signs, such as redness, swelling, and oedema, with pushing of the auricle outwards—signs which were formerly described as the typical clinical picture of mastoiditis—are wholly wanting, so one has to be guided largely by the signs in the drum membrane, the external canal, and the general condition of the child. When the history in these cases discloses a failure to gain normally in weight, with more or less serious gastro-intestinal symptoms from time to time, followed later on by marked loss of weight, diarrhoea, vomiting, extreme dehydration, and toxæmia, with a temperature which may run as high as 105°, mastoiditis should be considered.

When the above symptoms are present and do not respond to the ordinary methods of treatment with regard to regulation of diet, etc., operation on the mastoid presents itself as an alternative, and almost invariably there will be characteristic signs present in the ears to aid one in arriving at a decision. In addition to the above symptoms, the leucocyte count is generally elevated, the highest in this series was 39,000 per c.mm., the average being about 15,-

000. A roentgenogram is of no value as an aid to diagnosis until after the age of four years. Cultures taken from the mastoids at operation in our cases revealed the following organisms: *S. hæmolyticus* 8; *S. aureus* 10; pneumococcus and staphylococcus 3; *S. aureus* and *albus* 6; Gram-negative cocci 21; staphylococci streptococci and diplococci 2; Gram-positive cocci 4; Gram-positive cocci and a few lancet-shaped diplococci 1; Gram-negative fusiform bacilli and rare spirilla 1; no growth 8.

The severity of the symptoms did not appear to have any relation to the type of the organism found in cultures from the mastoids. The cases that were more severely ill, and showed more pronounced symptoms, such as, wasting, dehydration, etc., could be explained by the longer duration of the disease.

If the illness has been protracted, fluids in the form of glucose (5 per cent) in normal saline should be administered before operation; in many cases transfusion of whole blood is preferable. This procedure has to be followed in some of the more severe cases after operation. Careful attention to proper regulation of the diet is essential.

In the series reported here, ether-anæsthesia was administered in all but seven cases, which were done under local anæsthesia. Lately, I have been using local anæsthesia from choice and find the results more satisfactory. A solution of 0.5 per cent novocain with 1 minim to the drachm of a solution of adrenalin, 1 in 1000, is used. About 5 c.c. of this solution are sufficient.

The technique of the operation need hardly be described, as it differs little from that in the adult. The wound is washed out with a solution of mercurochrome when the operation is finished, and it is packed lightly with a narrow strip of gauze from the antrum outwards. One suture is placed at the upper part of the wound about half an inch from its commencement; the dressing is changed on the second day as a rule, subsequent dressings every other day, or daily, depending on the amount of discharge.

The following cases which are given in detail are more or less typical of the group of which I am writing.

CASE 1

J. J., a boy aged 13 months, of normal birth and development, was admitted to the Children's Hospital,

January 13th, on account of fever and restlessness. He had had a paracentesis of the right ear drum in the Out-Patient Department one month previously, because the drum was red and bulging. Adenoidectomy had been done on January 10th, three days before this admission. Examination now showed the right ear drum to be red, not bulging; temperature, 103°; acetoneuria; bowels costive; the baby pale and listless. Next day, the right ear began to discharge pus freely and the temperature fell to normal. This continued, but the baby kept failing clinically, with occasional vomiting, loss of weight, increasing fretfulness and pallor. On January 23rd, the left ear was opened, but no pus drained. There was bulging of the posterior wall of the right auditory canal, with marked external bulging, and with a leucocytosis of 20,100, so operation was decided on. On January 25th,

intravenously and subcutaneously, with careful diet regulations. He was kept under observation in the interval. He returned one month after discharge with severe diarrhoea; marked dehydration; temperature 103°; no acetoneuria; a leucocytosis of 10,050, and blood count of polymorphonuclears 67 percent and lymphocytes 33 per cent. The ear drums were both red. Double paracentesis resulted in no pus from the left; free drainage from the right ear, culture of which showed both staphylococci and streptococci. The treatment ordered was intravenous and subcutaneous glucose, with 15 per cent sugar solution by nasal drip, resulting in marked general improvement, but four days later the temperature was still elevated. On January 9th, temperature was 101°; leucocytes, 18,400; vomiting was present; and diarrhoea was recurring. On January 10th, under local anaesthesia the right mastoid was opened. No pus was found, but old granulation tissue from which the culture, unfortunately, was spoiled. The general condition at

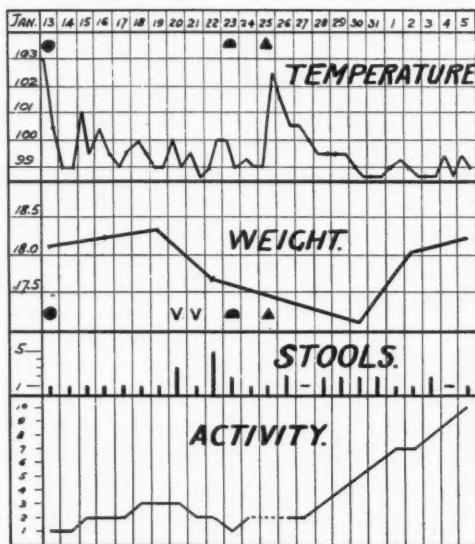


CHART I.—The large black dot indicates beginning of otorrhoea in the right ear; the half black dot, under date of January 23rd, is to indicate the date of paracentesis on the left ear; the solid black triangle indicates the mastoid operation on the right side.

under local anaesthesia, the right mastoid was opened. Extensive disease was found; free pus in abundance was met with under cortex; the dura in mid-fossa was exposed over a large area, also the lateral sinus. "Perisinus abscess present." Four days after operation the temperature came down by lysis; the leucocytes were 10,150 with polymorphonuclears 55 per cent, lymphocytes 45 per cent. The right ear discharged profusely from the canal. From that time on clinical improvement was marked and the gain in weight was rapid under carefully regulated feeding and quartz-lamp treatment. At the time of writing, the patient's condition is most satisfactory, a bright, happy baby, up to par in every way.

CASE 2

G. F., a boy, aged nine months, admitted to Children's Hospital on January 6th. He had been in hospital two months previously with severe diarrhoea, gastro-intestinal intoxication, and a varying temperature for which no cause could be found in the ears or nasopharynx, but perhaps related to a slight cough. The urine showed a trace of albumen and a few pus cells. He was discharged in four weeks cured; the treatment being nasal drip of 15 per cent sugar solution, glucose

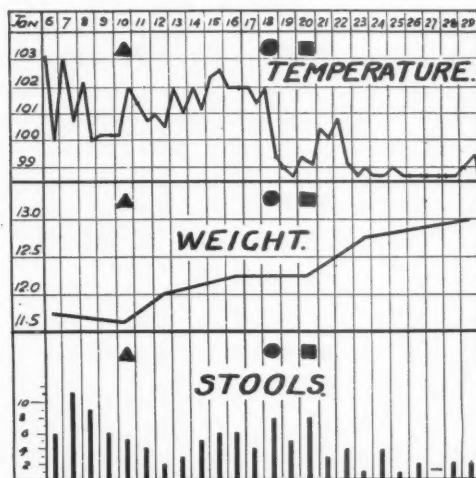


CHART II.—This chart, representing temperature, weight, etc., of Case 2, shows a solid triangle to indicate operation on the right mastoid; a large dot, to indicate beginning otorrhoea in left ear; a large square to indicate operation on the left mastoid. The frequency of the stools is represented by heavy perpendicular lines.

once improved; the stools became less frequent for a few days; and a gain in weight of 4.5 ounces took place in five days, but the temperature remained at 101°-102° until January 18th, when the left ear began to discharge, and then fell to normal. On January 20th, the left mastoid was opened, and a similar condition found. The culture was sterile. The temperature has remained normal since two days after this last operation, and the child has steadily gained weight from that time, on carefully regulated and gradually increasing feedings. The stools have remained normal since the last operation.

Sixteen of our cases had both ears involved, while the remaining twenty-nine had only one involved. There were two fatalities, and I feel that these could have been avoided had they been operated on earlier. There is practically no shock attendant on the operation. We have noticed repeatedly the appearance and condition of these little patients on return to the

wards after operation, and have remarked on this particular point.

Twelve of the operations were performed by Dr. James McGillivray and the remainder by myself. I wish at this point to thank Dr. Johnsson, our last year's senior interne, who assisted me with most of the operations as well as with much of the other work connected with their management. I am indebted to Dr. Caswell for her assistance of a similar nature, also for the preparation in detail of the two illustrative cases cited.

CONCLUSIONS

1. The type of mastoiditis occurring in infants and children, which is masked by symptoms arising in other parts of the body, and has up

to the past few years been looked upon as rare, is, on the contrary, of frequent occurrence.

2. The importance of a thorough otological examination in all cases of infantile gastro-intestinal disturbance combined with a rise of temperature and loss of weight cannot be over estimated.

3. I found local indications in all the above cases, that is to say, local otological indication for mastoidectomy. Finally, with complete co-operation between the paediatrist and the otologist the mortality in these cases has been greatly reduced.

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A CASE OF GAS GANGRENE*

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THE programme, I fear, is misleading insofar as my small contribution is concerned. It indicates that I am to read a paper upon the subject of "Gas Gangrene." This is incorrect. All I hope to do is to report a case of this nature that has occurred in my practice during the past year. I do not flatter myself that I am competent, either from experience or otherwise, to produce and deliver an address upon this important subject, discussing the bacteriology, pathology, clinical features and treatment. My reason for reporting the case is this; that I feel quite sure that had a patient with this complaint consulted me prior to the Great War, he would almost certainly have lost his life. It is not often that those of us who served as military surgeons find that what we learned in that capacity is of much benefit in the civil practice to which we returned. However, occasionally we meet a problem the solution of which may be aided by the lessons of our now half-forgotten war experiences. The case I am about to report is one in point. If gas gan-

grene were a problem of military surgery alone it would be merely of historical interest. The fact, however, that these cases crop up also in civil practice, makes it imperative that we should be able to make an early diagnosis, for failure here will prove a real calamity for the patient.

Prior to the war gas gangrene, or malignant œdema, was a surgical curiosity. Its entity was well recognized and descriptions of the infection could be found, especially in text-books on pathology and bacteriology, and in the sections of surgical works dealing with the subjects of infections in general. However, no definite rules for the therapeutic management of these cases had been evolved or established before the outbreak of the world war. This is evident from the frightful mortality due to this infection during the early months. The same thing, in a way, might be said of tetanus, but we did know what to do about tetanus; but the plague of gas gangrene was simply bewildering to the army medical authorities, until proper means of dealing with it in the wounded were found.

* Read before the annual meeting of the Alberta Medical Association, Calgary, September 14, 1927.

Regarding the bacteriology I shall say but little. Several anaerobic organisms, three or four, have been identified with the disease, the most common and important being the *B. aerogenes capsulatus*, or the bacillus of Welch. Several or all of these are probably natural inhabitants of the intestinal tracts of man and the domestic animals. The *B. aerogenes capsulatus* lives for long periods in the soil, and hence is often found associated with that partner in crime the *B. tetani*, in intensively cultivated and manured soils. Wounds contaminated with soil infected by these organisms are therefore very likely to develop trouble; and specially dangerous are (1), small punctured wounds which may or may not involve muscle, and (2), crushing injuries involving muscle-bellies, particularly those interfering with blood supply. It is scarcely necessary to say that most of the war infections took place in wounds of the latter variety. The history of the case I desire to report is as follows.

Case No. 6-10061.—A farmer, male, age 58, was admitted to the Holy Cross Hospital, October 10, 1926, complaining of swelling and intense pain in the right hand and forearm. On October 7th he was working in his barn, and as he grasped the edge of a bin to climb out, something, possibly a sliver or shingle-nail, pricked the ulnar side of his right palm. The injury was a most trivial one, and the patient noticed only a single drop of blood which he wiped away. During the night the hand began to pain and to some extent prevented sleep. The following day the hand was much swollen and intensely painful. His condition continued to grow worse throughout the day and he was unable to sleep at all the second night. During the forenoon of October 9th, the hand was opened front and back on the ulnar side, and through and through drainage established. No pus was found at the operation. Morphine was required to control the pain, which had not been relieved by the incision. Swelling and pain continued to increase until the patient came to Calgary and entered the Holy Cross Hospital at 5.30 p.m., October 10th.

The patient was a well developed vigorous looking man of middle age; temperature 101°; pulse, 110. The face was flushed; the tongue, dry and coated. Blood pressure: systolic 135, diastolic 78. The general examination was largely negative. The patient complained bitterly of pain in the right hand, which was much swollen, very tense and dusky in colour. The swelling was most resistant over the ulnar surface of the palm. A few small blebs could be seen on the back of the hand, such as might have been caused by hot applications. The swelling gradually subsided in the direction of elbow. The swelling of the arm-tissues was not marked, and the axillary nodes were apparently not involved. Although the pain was severe, tenderness to touch and pressure was not pronounced. The ulnar side of the hand presented two incisions, before and behind, with a strip of gauze passing through. There was a faintly putrid odour from the wound. No pus was discharging. The mental condition was bright.

The patient had a restless night, twice requiring morphine. The hand and forearm were kept in a continuous hot bichloride bath 1 in 6000 for the early part

of the night, and hot fomentations were applied every two hours for the remainder. The hand was becoming gangrenous on the ulnar side, involving the small and ring fingers. The odour was that of gas gangrene, but no feeling of crepitus could be detected in the tissues. An incision was made deeply into the ulnar side of the palm. No pus escaped but a grumous chocolate-coloured fluid with free bubbles of gas. The odour was now definitely that of gas gangrene. Orders were given to prepare the patient for a high shoulder-amputation. Dr. F. H. Mayhood saw the patient with me and concurred in my opinion regarding the nature of the infection and the necessity for prompt action.

Operation.—Amputation through the surgical neck of humerus. I decided that the infection had not yet reached the muscles above the elbow and used a long external flap, leaving most of the deltoid intact. All the muscles having their insertions below the elbow were followed up to their origins and cut off short. The short shoulder muscles were not interfered with. The flaps were left open, being approximated with two or three silkworm-gut sutures. The patient stood the operation well and returned to the ward in good condition. A swab taken from the hand at operation subsequently gave a growth of *B. aerogenes capsulatus*. 1,500 units of anti-tetanus serum were given. The after-history of the patient was uneventful. At the beginning of his convalescence the wound was dressed twice a day and flushed out with hydrogen peroxide. Hot moist boric acid dressings were used. The patient was discharged from hospital on October 20th, with the stump almost completely healed.

DIAGNOSIS

A few remarks on diagnosis.—It is not my intention to attempt an elaborate detailed description of signs and symptoms. You will find these given much better in a modern textbook. It may be permissible, however, to mention a few points as high lights, some of which may serve to differentiate this infection from that much more common condition, septic cellulitis. First of all, there is the characteristic sign, gas in the tissues. It is not always possible to see the gas bubbles, or to make out crepitus by touch. However, in using the knife one has the feeling of cutting through lung-tissue or one of those fungi popularly called "puff balls." Also, the cut tissues do not bleed. The onset is rapid, but of course this does not distinguish the condition from an acute cellulitis. There is rapid destruction of tissue, chiefly along the course of the muscles. There is, as a rule, no involvement of the lymph-nodes. The temperature is not high. There is no delirium, the mental condition remaining unexpectedly clear. The pain is intense and without remission. On the other hand, local tenderness is not much in evidence. The reason for this can be readily appreciated. This lack of local tenderness is in sharp contrast to the state obtaining in acute cellulitis, in which the

patient will almost flinch if you but glance at the affected part. Last, but not least important, is that indescribably menacing odour that often of itself is sufficient to make the diagnosis certain.

TREATMENT

If the trunk muscles are involved a complete surgical eradication of all the involved tissues should be made and the wound left wide open. If a limb is affected, high amputation is the most conservative treatment. The ordinary rules of amputation do not apply here. No attention should be paid to lines of demarcation, as in other forms of gangrene. A decision should be made boldly as regards the sacrifice of a limb. The surgeon must get above the origins of the infected muscles. Whittling or creeping amputations are bad enough under any circumstances, but in these cases will lead the patient straight to disaster. All the muscles

under suspicion should be followed up to their origins and removed completely and the flaps left open, or at most approximated with a few retaining sutures. Many advise suffusing the open end of the stump with hydrogen peroxide, as was done in this case. Whether it does any good or not I do not know. If the disease has all been removed it is probably not necessary, and if any be left it will likely be useless. Nevertheless it can scarcely be harmful and may be worth while. It is a wise precaution to give such a patient 1,500 units of tetanus antitoxin, as the tetanus germ is so often associated with the offending organism. Above all, the surgeon should not wait for a laboratory culture before determining his line of treatment. A serum was used by the French and Germans early in the war, and by the British and Americans in 1918. No very spectacular results followed.

ASCARIASIS: A FACTOR IN DIAGNOSIS AND TREATMENT

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IN this country the round worm, *ascaris lumbricoides*, usually receives scant consideration as a factor in either diagnosis or treatment. In the Orient quite the reverse is true, and it may be of interest to the profession to read something of the vagaries indulged in by this very frequent inhabitant of the intestinal tract of Oriental patients. In view of the rapidly increasing foreign population in Canada, this matter may perhaps come to occupy more of our attention than it does at present.

It is not the purpose of this article to attempt to deal with the subject in an exhaustive way, but merely to draw attention to some of the consequences that may result from ascaris infestation.

At the Canadian Mission Hospital, Hamheung, Korea, routine stool examination reveals 99 per cent of the patients admitted to be harbouring ascarides; about 70 per cent are also infested with trichuris; while the *Entamoeba histolytica*, *Tænia*, and *Ankylostoma* are also

often found in that relative order of frequency.

The administration of a general anæsthetic often seems to cause the round worm to wander, and specimens are frequently seen to escape from the nose or mouth of a patient just recovering from the effects of an anæsthetic. Needless to say, anthelmintics are, whenever possible, administered before operation.

COMPLICATIONS DUE TO THEIR PRESENCE

Serious complications may arise from their presence, as in the following cases.

CASE 1

Double salpingectomy had been performed, but the patient, for no obvious reason, had a very stormy convalescence. Inspection of the wound on the second day after operation revealed two lively specimens of round worm in the dressing. It was impossible to say whether others, failing to escape from the wound, still remained free in the peritoneal cavity. The patient eventually made a good recovery.

CASE 2

A young woman, who had been ill for nearly a month, was brought to hospital because of having had several severe hæmorrhages per rectum. A diagnosis

was made of typhoid fever, and the case treated accordingly, but the hæmorrhages continued until the patient was in a state of collapse, and unconscious at times. A couple of round worms were then found in the bed-pan, and it was thought that the presence of these parasites in the ulcerated bowel may have been a causal factor in producing the bleeding. Although the general condition of the patient was poor, santonin was administered, and many worms were expelled. The hæmorrhages ceased at once, and the patient made a good recovery.

ACUTE CONDITIONS SIMULATED

Ascariasis may also simulate some acute conditions, as in the case about to be cited.

CASE 3

A well developed little girl, three years old, was brought to the hospital by the mother, who stated that the child had had diarrhœa since the previous day, when she had vomited once and complained of abdominal pain. Since then worms were passed each time the bowels moved. Enquiry elicited the fact that there had been no blood or mucus in the stools.

The child did not seem to be in any pain when seen and examination apparently caused no discomfort. In the right lower abdominal quadrant was a firm sausage-shaped tumour, extending upward and then across the abdomen to the location of the splenic flexure of the gut. The differential diagnosis had to be made between acute intussusception, with ascari infestation as a complication, and ascari infestation alone.

A high enema was given which resulted in copious green stools and one specimen of ascari. A second examination revealed no change in the condition. Another enema produced more foul stools, and no more worms, but examination now showed that part of the tumour on the left side of the midline had disappeared. A few hours later the whole of the tumour was completely gone. Santonin and calomel were given night and morning. The child expelled many worms and showed no more symptoms.

These parasites may be the actual cause of that surgical emergency known as the "acute abdomen," as in the next case.

CASE 4

A woman about forty years of age, a nurse, was suddenly seized by acute violent spasms of abdominal pain, together with absolute constipation which could not be relieved by enemata. A diagnosis was made of acute intestinal obstruction of doubtful origin, with the ascari not unsuspected, and it was felt that the abdomen should be opened. This was done immediately and it was found that the obstruction was in the middle portion of the ileum and caused by a mass of round worms tangled together. The size of this mass itself was not great, not sufficient, one would have thought, to cause a mechanical obstruction, but the bowel was tightly contracted for a distance of two inches about this mass, while the typical collapsed condition below and dilatation above the obstructed portion were quite definite. No attempt was made to remove the worms. The abdomen was closed and an anthelmintic administered the next day with excellent results. A good recovery was made.

FATAL RESULTS NOT UNKNOWN

Deaths due to the round worm, though not

very frequent, undoubtedly occur, as is borne out by the following cases.

CASE 5

A man, about sixty years of age, was brought to the hospital on the fourth day with acute intestinal obstruction. His condition was poor; the pulse, rapid; respiration, shallow and quick; and abdominal distension, marked. Operation was at once performed, though without much hope of being able to save the patient. The jejunum was distended to an extreme degree, and the distal part of the ileum and large intestine collapsed. Between the distended and the collapsed portions was a segment of bowel, about three feet in length, which was packed solid with a mass of round worms. Other worms could be seen and felt both proximally and distally to the obstructed area, but not in dense masses as in that segment.

The bowel was opened at the proximal end of the obstructed part and an attempt made to drain it. Many worms also escaped and scores were removed by forceps but, the condition of the patient requiring haste, it was not possible to attempt to remove even all the worms in the vicinity, and others kept sweeping down from above. The largest tube available was left in the lumen of the bowel and the operation concluded. In a few minutes the tube was blocked by a mass of worms, and the patient died a few hours later.

CASE 6

A girl, aged seven, was brought to the out-patient department with the following history. Previous illnesses were measles, malaria, and dysentery, from which good recoveries were made. In the midst of apparent health the child had recently begun to lose appetite and weight, and to complain frequently of nausea and abdominal pain. She had passed worms on several occasions and some specimens had escaped from her mouth.

The usual dose of santonin was given and about fifty worms passed, but the symptoms did not improve and the laboratory continued to report the stools positive for ascari ova.

Several days later, February 15, 1927, the child was admitted to hospital. Examination showed much loss of flesh, the skin, hot and dry; tongue, coated; herpes on lips; pulse rapid; temperature 38° C. (100.4° F.); respirations, 25 per minute; bowels constipated; anæmia and weakness marked. Examination of the chest revealed nothing of note. The abdomen was considerably swollen, uniform, tender; the percussion note was tympanitic, except in the hypogastric region, dullness here remaining constant on change of position. The pain could not be localized, and the tenderness, which was marked, was general over the whole abdomen. Slight rigidity, corresponding to the area of tenderness, was present. Hæmoglobin, 80 per cent; red cells, 4,032,400 per c.mm.; white cells, 12,600. Urine was normal. In the fæces ascari and trichuris were present. The Widal test was negative.

The condition was considered to be due to the presence of the round worm, and the possibility of free worms in the peritoneal cavity setting up peritonitis was thought of.

Hot turpentine stupes were applied to the abdomen and santonin was administered and repeated after several days. This resulted in the passage of worms almost daily, in numbers ranging from 1 to 19, until she had passed about 100. The acute symptoms soon disappeared, but some abdominal discomfort remained, and there was no improvement in the general condition. The laboratory still reported ova in the stools. More santonin was not given at this time, lest part of her trouble might be due to toxic effects from the drug.

The patient was discharged March 2nd, and re-admitted March 7th. Her temperature on admission was 103° F.; pulse, 90-100; respirations, 30. She was now

emaciated, very fretful and irritable, complaining and crying out with constant abdominal pain not localized, and eating scarcely anything. The chest was normal; the abdomen soft and tender; and in the midline below the umbilicus was a very definite firm hard nodular mass, tender, slightly movable, and with well marked borders.

Stool examination: showed amœba +; ascaris +++.

Blood count: red cells, 3,920,000; white cells 7,400; hæmoglobin, 65 per cent.

Symptomatic treatment was given and santonin again administered. About fifty more worms were passed during a period of several days.

On March 8th, the tumour mass had shifted its position and was now in the left lower abdominal quadrant. On the 10th it had disappeared, and the child said she was better. On the 14th, oedema of the feet was noticed. She complained again of pain and the temperature rose to 38.7° C. (101.6° F.) On the 20th, the temperature fell to subnormal and remained there. The oedema increased and diarrhoea set in. On the 22nd she complained of severe pain in the left shoulder and arm, but none in the abdomen. Examination of the shoulder revealed nothing abnormal. The bowel movements now became frequent and involuntary and many more worms were passed. The pain in the shoulder was severe and constant until death occurred on April 2nd.

At the *post mortem examination* the pericardial and pleural cavities were found to contain small amounts of straw-coloured fluid. There were slight adhesions to the diaphragm at the bases of the lungs, and in the left side of the diaphragm was a perforation about an inch in diameter.

The liver was found to be very large, extending on the left as far as to the spleen, and adherent to it and to the splenic flexure of the colon. The intestines were slightly distended in places, collapsed for the most part, and showed no sign of tuberculosis or ulceration. Just below the spleen a portion of the peritoneal cavity was walled off by adhesions, forming a sort of pouch or pocket. This space was traversed by the splenic flexure of the colon, in which were three apertures any one of which would readily admit the finger. Several worms were protruding through these openings. The compartment also contained small amounts of faecal matter and thirty-five worms.

The alimentary tract when opened revealed thirty-seven more specimens distributed more or less impartially all the way from the stomach to the rectum. The gall bladder was small, empty, and shrunken, but the common duct was dilated to the size of a finger and contained thirteen worms. The inferior surface of the liver appeared to be normal, but on the diaphragmatic surface were several dark patches with small whitish vesicles scattered over the surface. On puncturing these, pus escaped. On making a transverse section through the

liver, the whole area was found to be infiltrated with thick yellow pus, quite unlike the pus of tropical liver-abscess. Several worms, having penetrated through the whole thickness of the organ, were found on the diaphragmatic surface close under the capsule.

These parasites on being exposed to the warm air, twenty-four hours after the death of the host, became again exceedingly active, squirming about in a lively fashion.

COMMENT

The presence of the round worm in the human intestinal tract may be of more consequence than is generally thought. The degree of danger does not necessarily depend upon the severity of the infestation, as a few worms only, if they take to wandering, may cause serious trouble. The ways in which they may do this are not by any means exhausted in this paper.

In the last case cited, at what stage did the worms perforate the bowel, and when did they invade the liver? Did the repeated administration of santonin have anything to do with this by causing the worms to attempt escape from the bowel? Did the drug have a toxic effect on the patient beyond what is normal? It was given only in the ordinary dosage for the age of the child.

The pain in the left shoulder was doubtless a reflex one, corresponding to that often complained of in the right shoulder in disease below the diaphragm on the right side. With such involvement of the liver why was there no pain in the right shoulder?

The fact that the child had previously suffered from dysentery had probably nothing to do with this later condition, as amœbæ were reported in only one of many faecal examinations, and there were no symptoms of the disease while the child was in hospital, nor signs of it at the post-mortem examination.

Dr. S. Bayne-Jones, of the University of Rochester Medical School, has taken motion picture reels of thousands of generations of bacteria that enable a spectator to follow them through many days of growth and activity in a few minutes. Micromovies will aid biologists in working out obscure growth processes of many rudimentary forms of life, it is said, and in addition, classroom reels may be made for the instruction of students of medicine and industrial bacteriology. One of the chief difficulties which had

to be overcome was to maintain the microscope in accurate focus, which required elimination of vibration from the camera part of the apparatus. Most of the negatives which have been made to date call for one exposure a minute, and when the positives have been prepared they are run through the projector at the rate of 16 pictures a second, which gives the effect of compressing the life histories of the microscopic plants and animals. — *Science*, February 15, 1928.

PERIODICAL HEALTH EXAMINATIONS*

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HISTORICAL

AN English physician, Dr. Horace Dobell, is credited with the first reference in medical literature to the need of periodic health examinations. His book, published in London (1861), is entitled "Lectures on the Germs and Vestiges of Disease, and on the Prevention of the Invasion and Fatality of Disease by Periodical Examinations." An extract from this book reads as follows:—

"I am perfectly convinced, from my own observation and experience in practice, that patients never think of consulting their doctors till these conditions of impaired general health have advanced far enough to have been developed into some form of disease; that thousands and thousands of people, believing themselves to be in health, are nevertheless undergoing these early, occult, and evasive stages of defect in the physiological state; and that such persons may be considered to be in health, not only by themselves, but by anyone accustomed to associate with them, even though it be a physician, and that even if they submit to a medical examination as ordinarily conducted, they may be declared to be in health.

I wish, then, to propose as the only means by which to reach the evil and to obtain the good, that there should be instituted, as a custom, a system of periodical examination, to which all persons should submit themselves, and to which they should submit their children.

If such a plan as I have here proposed were to be faithfully and conscientiously carried out by the present and rising generation of well-educated studious medical men, I think no one can doubt, after a careful consideration of the subject, that immense benefit would be conferred on the public."

Although Dr. Dobell recommended his plan to the British life insurance companies at the time, no action was taken. This far-seeing physician attained the age of eighty-nine, and lived to find his idea start *de novo* in America and make rapid headway.

Periodic health examinations were first instituted in the United States about fifteen years ago by insurance companies, industrial, and health organizations. Since then the movement has spread rapidly until, at the present time,

many hundreds of thousands of such examinations are conducted annually. Curiously enough, the last to consider the subject seriously was the medical profession. It was not until 1923 that a committee of the American Medical Association investigated and reported favourably. This was followed two years later by the publication of a manual by that Association containing suggestions for the conduct of periodical examinations. Since then, various universities and hospitals have opened special health clinics where these examinations are carried out by competent physicians. The public demand for this service is increasing daily. In Canada various insurance companies and industrial organizations, (chiefly those with affiliations in the United States), have attempted periodical examinations. Little progress has been made, however, owing to the fact that the medical profession generally has not been prepared to give the required service. In 1926 a committee of the Canadian Medical Association reported favourably on the scheme and, it is understood, a manual of instruction will be published shortly.

ADVANTAGES

The advantages claimed for periodical health examinations are many. Only a few of the more important ones need be discussed here.

Examination of large groups of apparently healthy persons, such as took place during the Great War, revealed a surprising number of physical defects, faults in personal hygiene, and bad habits of living. The untoward influence of such defects and faults on longevity has been recognized by insurance companies, and is the main reason why many of these companies are providing facilities for periodical examination to their policyholders.

A common fault, due usually to dietary indiscretions and lack of proper exercise, is overweight. An individual above thirty years of age, who is overweight, has a less favourable mortality rate than one of normal weight. For

* A lecture delivered in the Extension Course in Industrial Medicine arranged by the Department of Public Health and Preventive Medicine, McGill University, 1928.

example: a man aged 40, height 68 ins. and weight 189 lbs. (average 158 lbs.) has by excessive weight increased his mortality ratio to 20 per cent. Therefore, he should be guided in reducing his weight.

Among the common physical defects, unrecognized or neglected, are foci of infection. While there may at present be a tendency to over-emphasize the part played by focal infection, it cannot be denied that many chronic organic diseases owe, if not their origin, certainly their chronicity to the toxæmia maintained by septic foci. By means of the periodical examination these physical defects, errors of hygiene, and faulty habits may be recognized and corrected, thereby attaining greater physical and mental efficiency throughout life.

With the advance of medical research we have become more and more impressed with the necessity of early recognition of disease if we are to effect a cure or arrest its progress. The periodical examination affords the opportunity of detecting the onset of insidious diseases, of removing the causes, or arresting their progress before the damage is irreparable and the cure hopeless. Furthermore, by carefully kept records, these examinations will eventually supply to the medical profession a wealth of valuable data on the early symptoms and signs of disease which may revolutionize our existing ideas regarding causes, predisposing factors, and methods of prevention.

It is intended that the examinations should commence in infancy. As the individual is observed year by year, faults of development may be recognized, checked if possible, and their influence on later health noted. This contact with the medical profession, at regular intervals, affords an excellent opportunity of imparting, at the proper age, knowledge of sex-hygiene, and of adapting the discussion of this subject to the type and mentality of the individual. Most authorities are agreed that, if the public generally were in possession of the simple sane facts regarding the reproductive function and sex-hygiene, the present misleading and false emphasis placed on sex would be dissipated; there would be less venereal disease and more happy marriages.

There are many other advantages of periodical examinations, but enough have been men-

tioned to show the great possibilities of such a system in the fields of preventive medicine, research, and social hygiene.

PRESENT STATUS

The present status of the movement is one of trial. It is an experiment on a large scale, the ultimate success of which is dependent on at least two important factors.

The first of these is the confidence of the public in the value of periodical health examinations, and its continued interest in re-examinations. During the past decade the attention of the public has been directed toward health problems by educational campaigns through various channels, and, interest having been aroused, there is an ever increasing demand for medical examinations. The continuance of this demand will depend upon the benefits derived becoming matters of general experience. For a time, the public will be critical. But, if the examinations are conscientiously carried out by competent physicians, the confidence of the public will be retained. It is clearly the duty of our universities, health departments, and the profession generally, to see that this confidence is not exploited by commercial institutions and unqualified practitioners.

The second factor is the willingness and ability of the medical profession to conduct the examinations properly and to give the necessary counsel. However willing the profession may be to undertake this work, I do not think that, at present, it is adequately prepared to do so. Most of us have been trained to recognize and treat existing disease. Such subjects as preventive medicine, dietetics, physical training, and social hygiene have not been taught seriously and in detail, yet a sound working knowledge of these very subjects is essential to the physician conducting a health examination. Therefore, in order to prepare for work in this new field every physician should attend a recognized health clinic for instruction, or at least undertake an intensive study of some of the better books and manuals on these subjects. A physician should either qualify for this new service or refuse to make a health examination. Incalculable harm may be done to this public-health movement by incomplete examinations followed by ill-considered vague advice.

In the United States the examinations are frequently made at health institutes, where dietary and hygienic advice is given and the client referred to his personal physician for the correction of physical defects or the treatment of disease. Such a system tends to develop an impersonal, mechanical, and, perhaps, commercial attitude toward the client, and is not so satisfactory as having the complete examination conducted by one competent physician.

METHOD

It is not possible within the scope of this paper to discuss in detail the method of making a health examination. Some of the more important principles may, however, be mentioned. At least an hour should be allowed for the examination, and it is, therefore, advisable to do this work by appointment rather than during regular office hours. It is also necessary to adopt, and adhere closely to, a strict routine, thus avoiding loss of valuable time and the possibility of overlooking part of the examination. Assistance in following a routine, and in keeping careful records which is so essential, may be obtained by the use of one of the many standard forms which have been issued. The one recommended and published by the American Medical Association is readily obtainable and has the advantages of being comparatively small and brief, yet adequate for general purposes. The industrial physician will probably find it more convenient to draw up a special form suited to his particular industry and its environmental conditions.

At the conclusion of the examination, the positive findings are surveyed and an estimate made of the client's physical defects, faults of diet, hygiene, etc., and their bearing on health. These are discussed in detail with the client and a health prescription prepared. This prescription should relate to all phases of the client's health needs, and should outline what he should do *re* diet, rest, exercise, habits, and correction of physical defects. Ordinarily, such a prescription contains no reference to drugs. The following example of a health prescription is quoted from the manual on periodical examinations of the American Medical Association.

"K. Jones. Summary: A neurotic school teacher, aged 35. Neglects her teeth. Wears glasses that do

not fully correct her vision. Boards in an uncongenial environment. Eats too little for breakfast and lunch. Has no recreation or exercise.

Health advice given to Miss Jones. Date.

1. Visit your dentist and follow his advice on the care of your teeth.
2. Have Dr. Smith re-examine your eyes.
3. Add an orange and cereal to your present breakfast.
4. Substitute milk for tea at lunch.
5. Exercise ten minutes morning and night as instructed.
6. Attend opera or concert each week and take up your own practicing a little each day.
7. Arrange to change your present room mate.
8. Report back in three weeks.

Signed."

On first thought a prescription such as this seems trivial, and yet subsequent records show that this client's general health improved materially, her weight came up to normal, her nervousness improved, and her annual dental bill was reduced.

RESULTS

The results obtained from periodical health examinations have already proved their great value. Two reports only need be cited. In 1922-1923, health examinations were given to 958 persons in New York City, under the direction of a committee of physicians, all members of the New York Academy of Medicine. These people of various races, both sexes, all ages, and chiefly from wage earners' families and others of limited or insufficient means, either did not consider themselves in ill health at the time of the examination, or were obtaining no medical care for conditions of which they were aware but for which they believed medical treatment unnecessary. Of the 958 examined, 2.5 per cent were found to be in good health; 72.7 per cent needed definite medical treatment; and 24.7 needed only hygienic advice, to correct or arrest existing errors of bodily function or defects of structure. Thirty-seven cases of organic heart disease, twenty-two cases of syphilis, and twenty-eight cases of suspected tuberculosis were found. The Metropolitan Life Insurance Company published in 1924 the results of six years' experience with the first 6,000 of its policyholders periodically examined. It was found "that a total of 217 of these originally examined persons had died. As a matter of fact, we had expected 303 of them to die in the same period. In other words, the group as a whole gave a mortality of 72 per cent of the expected. There was, therefore, a

saving of 28 per cent on the mortality, according to the American Men Table, which approximates the experiences of most ordinary companies." The Company also tested this out in comparison with the experience with their whole body of ordinary policyholders who had been insured prior to 1915, and found that the difference in mortality between these examined

people and the latter was 24 per cent in favour of the examined.

It may be concluded, therefore, that periodical health examinations are of definite value, and it is to be hoped that the medical profession generally, our universities, and our hospitals will co-operate in advancing this important branch of preventive medicine.

THE EFFECT OF CALCIUM, POTASSIUM AND SODIUM CHLORIDES AND POTASSIUM AND SODIUM CITRATES IN CERTAIN CASES OF DELAYED HEALING

By W. L. T. ADDISON, B.A., M.D.,

Toronto

THE cases of delayed healing experimented with were of the chronic ulcer type rather than those with sugar intolerance, or infective processes. To these cases in which the tissues seemed at fault might perhaps be added those with tissues damaged by x-ray or radium exposure. It would be interesting to try similar experiments on cases of scurvy.

This type of case is one in which the factors which make for degeneration of tissues are slightly in excess of those which make for regeneration and are balance cases by which one may try out the causes of degeneration and of regeneration of tissues.

The work here reported grew out of an accidental finding in which calcium chloride was given to control a case of secondary hæmorrhage. The granulations in this case were grayish blue in colour and sloughy in type. The calcium chloride not only checked the hæmorrhage but the granulations within 36 hours became bright red and were more than normally abundant.

The dosage used was 90 grains per diem. This led one to try out the same salt on chronic ulcers to produce acceleration of the filling in of the ulcer.

Dr. Robertson was good enough to place certain infected sinus cases and one of ulcer through mechanical obstruction of the circulation at my disposal, but in all of these cases the results were negative. Dr. F. N. G. Starr tried out the calcium chloride in some private cases and was good enough to permit the trying out

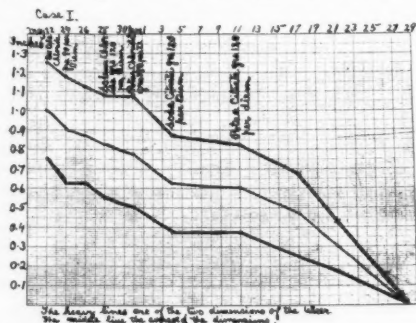
of work in his clinic. Dr. Malcolm Cameron was good enough to carry on a group of such cases at St. Michael's Hospital which he reported in the *Bulletin*. One of these cases was of a sinus from a tuberculous kidney and was negative. The others were positive.

The cases upon which the experiments were carried out were as follows:—

CASE 1

Mrs. S., aged 52, fell from a chair on which she was standing, bruising her shin and producing a slough which had not separated when I saw it 6 weeks later. Such granulations as existed at that time were scanty and of a grayish sort. She was put on calcium chloride, grains 90 per diem, in 3 doses, and a 1 per cent lysol dressing under oiled silk applied. At the end of two days the slough had separated leaving a few strands of fibrous tissue and an ulcer in which the granulations were much redder.

Two days later the base of the ulcer was filling up actively with bright red granulations and 120 grains of sodium chloride per diem was given for 3 days. A slight lessening of the ulcer occurred in these three



days but the rate of healing as seen in the chart was much retarded. The granulations became gray and unthrifty. Potassium chloride was then given at the rate of 120 grains per diem for four days with a more

overcome by the calcium chloride in 90 grain doses per diem and an active phagocytosis secured.

It is seen that potassium chloride is a very efficient salt in bringing about tissue regeneration and that potassium citrate is an equally efficient salt. The soda salts respectively slowed down the efforts at regeneration.

In Case 2 the citrates only were used. The potassium citrate when given in 180 grain per diem doses or more, brought about very rapid closure of the ulcer, but when dropped to 120 grains or less per diem healing was at a standstill. Perhaps the most instructive feature of the experiment was that 270 grains of potassium citrate produced more rapid healing than 180 grains. When one adds to the 270 grains of the citrate taken the potash content of a quart of milk that the patient was taking, *viz.*, 63 grm. of potassium citrate, the patient was getting 333 grains of potash plus whatever he got from his vegetables.

The experiment is incomplete in that the potash should have been further increased to see if 360 grains or more of potash were the optimum dose. If opportunity offers this optimum dose will be sought for.

The effect of the soda citrate proved more instructive than hoped for, and the occurrence of a new ulcer shows that the excess of soda not only checks the regeneration of the endothelial cell in granulation formation but may even break down a well established scar of fibrous connective tissue.

Hald has shown that in nephrectomized animals the quantity of potassium chloride absorbed by the tissue is not a small one, 22 to 23 centigrams per kilo. This is a fairly constant quantity. In the animals with kidneys the tissues continue to absorb the potash until the blood potash rises above normal, at which time the kidneys commence to excrete it, and toxicity arises only when the kidneys cannot keep pace with the amount injected. Only doses of 1 grm. of potassium chloride per kilo have a toxic action if given subcutaneously.

The amount of potash absorbed by the tissues is 231 grains per person of 150 lbs. weight. This makes no allowance for current

excretions of potash salts by the kidney and it would appear from the avidity of the tissues for potash salts that in the main the tissues are undernourished as to that part of their salt metabolism.

In so far as human milk may be taken as a standard of requirements for normal growth it is to be noted that human milk has .078 per cent of potassium oxide or .123 potassium chloride. The quantity of human milk required for the average baby at 2 weeks old is 20 oz., that is 11.7 grains of potash salts per 8 lbs. An equivalent for a person of 160 lbs. would be 234 grains per diem.

CONCLUSIONS

1. That calcium chloride not only exaggerates phagocytosis toward bacteria, as shown by Nagai and Ito, but accelerates the phagocytosis toward dead tissue and accelerates the regeneration of tissue (granulation tissue).
2. That the potash salts greatly accelerate the regeneration of granulation tissue and maintain the vitality of the endothelial and fibrous tissue.
3. That increase of the soda salt inhibited in Case 1 the regeneration of the tissues, but in Case 2 actually caused the breaking down of the granulations already formed and the breaking down of well established scar tissue to form a new ulcer.

It seems too much to hope that the functions of the body salts in relation to degeneration and regeneration of tissues have been worked out, but in so far as these experiments go the evidence would seem to show that the soda ion tend to bring about a degeneration of the vessel structures and the calcium and potassium a regeneration of these tissues.

If any value accrues from these investigations it should be in prophylactic dietetic hygiene.

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THE SUPPLEMENTARY TREATMENT OF THE OPERATIVE
TOXIC GOITRE PATIENT*

BY WILLIAM E. JOHNSTON, M.D.,

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THE widespread improvement in the statistics relating to thyroid surgery in the past few years is mainly due to the more general appreciation of three basic principles in the supplementary treatment of the operative toxic goitre patient. These basic principles are: first, adequate preparation of the patient pre-operatively; second, efficient protection of the patient at the time of operation; third, effective care of the patient post-operatively. These three form the sound foundation on which rests successful thyroid surgery.

THE PRE-OPERATIVE PREPARATION

It is necessary for the internist, pathologist, and surgeon to work in close co-operation, so as to obtain a thorough knowledge of the patient. This requires an intelligent study of the patient's complaints and symptoms, associated with searching clinical and laboratory tests of the patient. The examinations considered necessary are: a general physical examination; complete urine and blood studies; special cardio-respiratory survey, including electrocardiograms, if indicated; and basal metabolic estimations. X-rays may be helpful in determining the presence of a substernal goitre. A laryngoscopic examination will ascertain the present condition of the vocal cords. With these studies completed, the pre-operative preparation of the toxic goitre patient is established with two purposes in mind. First, the treatment of associated diseases requiring attention; second, the reduction of the patient's hyperthyroidism to a degree of operative safety, the endeavour being, as Charles Mayo has said, to make the patient safe for the operation.

The treatment of associated diseases.—The condition most commonly associated with hyperthyroidism requiring treatment is toxic myocarditis, with or without auricular fibrillation.

When toxic myocarditis is present without fibrillation, the cardiac state will relatively improve with the decrease in the hyperthyroidism as the result of the treatment of this factor. However, if auricular fibrillation is present it requires specific treatment. Digitalis is given. This drug is considered of therapeutic value only in the irregular heart of fibrillation, and not useful in the fast heart of toxic myocarditis.

Diabetes mellitus is the next most frequently associated disease. This disease is controlled by insulin, glucose, alkalies and diet. The exact status of the patient's condition is followed by daily blood-sugar estimations and urinalysis.

The problem as to whether associated foci of infection should be eradicated before or after thyroidectomy is still debatable, and each case requires individual judgment. If the degree of hyperthyroidism is low or moderate it is considered better to clear up the existing foci, whether in teeth, sinuses, tonsils or elsewhere, especially if the patient is young. However, if the patient is very toxic the benefits derived from the eradication of the foci of infection will not balance the damage done by the delay in ameliorating the hyperthyroidism.

In the presence of another disease, demanding a major operation when the patient is highly toxic, it is felt that thyroidectomy should take precedence. Thyroidectomy may be done usually with impunity during pregnancy, if improvement does not result from conservative measures.

Occasionally the toxic goitre patient has a psychopathic problem independent of his hyperthyroidism. It is important that this be handled by a psychiatrist pre-operatively and post-operatively.

Reduction of the patient's hyperthyroidism.—The degree of toxicity of toxic goitres runs in irregular cycles. Operation should not be performed with an increasing basal metabolic rate. The basal metabolic rate should be on the decrease and the optimum time is at the stage of

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the maximum improvement that may be expected from the preparatory measures. Every therapeutic measure of value is used to reach this goal of decreased toxicity, of operative safety. Thyroid surgery is planned and timed, and is never an emergency operation.

Rest is the first requirement. If it is practical to hospitalize the patient this measure is better enforced. The patient is confined to bed, with or without bathroom privileges, depending on the degree of toxicity. The patient's co-operation is sought to obtain relaxation by covering the eyes in a darkened room for two periods of an hour each during the day. No visitors are allowed except the immediate family, for a short period each day, if they are congenial. Newspapers and other reading material are withheld. Smoking is prohibited.

With the immediate environment conducive to rest and relaxation, the patient is further aided by the use of sedatives. The most commonly employed agents for this purpose are luminal and the bromides. Others less commonly used are the opium derivatives, chloral hydrate, medinal and allinol. Although rest and sedatives are important therapeutic agents in attacking the patient's hyperthyroidism, the most important and efficacious is iodine. Although one of the oldest remedies for the toxic goitre, its exact part in the process of hyperthyroidism is still obscure. From the indiscriminate use of this drug for all types of goitres a few facts are becoming evident on which to base the truth. While there is a wide diversity of ideas, the consensus of opinion has to be summarized to form a working basis. It is thought that iodine is of use prophylactically in the prevention of colloid goitre, prenatally, and during childhood and adolescence. As a therapeutic drug, it is felt that its usefulness is limited to colloid goitre and as a preparatory agent for surgery. Iodine does reduce the degree of hyperthyroidism, but its action is not permanent, and is limited and has to be augmented by surgery to procure a cure of the toxic state. The widespread use of iodine in water and salt by the public health authorities should be further studied before complete approval is given by the medical profession. In the pre-operative preparation of the toxic goitre patient, iodine is administered in the form of Lugol's solution, which is 10 per cent potassium iodide and 5 per cent iodine dissolved in water.

Small doses of from 10 to 30 minims a day of this solution are given, either in water or in a gelatine capsule. Iodine is given to both the hyperplastic and adenomatous goitre as a preparatory measure. If the patient's goitre is stimulated to a further degree of overactivity it is discontinued.

The patient's intake of fluids is important and should be from 3000 to 5000 c.c. for 24 hours. No tea or coffee is given. Water is varied with fruit juices. The patient is given a full diet. Liquid petrolatum and enemata are used as required. Sodium bicarbonate is given to supply alkali.

From the first contact with the patient, the surgeon endeavours to gain and hold the patient's confidence. This is done mainly by diplomatic honesty. No endeavour is made to steal the goitre. The patient's exact condition is gradually and tactfully discussed with the patient, and as the toxic state decreases under treatment the necessity of operative procedure is urged. The majority of patients realize that surgery is inevitable and are anxious to have the operation. The patient is told of the decision to operate the evening before, and frequently expresses relief and a willingness to get through with it.

On reviewing a recent one hundred consecutive cases the average basal metabolic rate before preparatory measures were instituted was plus 51.82 per cent. The average immediate pre-operative basal metabolism was plus 30 per cent. The average length of hospitalization before operation was considered safe was four days. The average decrease in basal metabolic rate was 21.82 points, during a period of four days active preparation under the regime just given.

Immediate pre-operative treatment. — With the operation planned for the next day, the patient is given 1000 c.c. of fruit juices, to which has been added 20 drachms of glucose in the evening. This measure gives the patient a storage of ready fuel to carry him over the operative day. An extra dose of 10 minims of Lugol's solution is given at 8.00 p.m. The neck is shaved. Breakfast is omitted on the morning of operation. A simple soap enema is given at 6.00 a.m. Ten minims of Lugol's solution is prescribed at 7.00 a.m. At the same time one-sixth of a grain of morphine sulphate is in-

jected. When the patient is called to the operating room a further dose of a sixth of a grain of morphine and also 1/150 of a grain of atropine is administered hypodermically.

THE OPERATIVE PROTECTION OF THE TOXIC GOITRE PATIENT

Sound surgical judgment and manipulative skill on the part of the surgeon are the patient's greatest protection during the operative stage. The purpose of the surgical procedure is to cure if possible the patient's hyperthyroidism. The best surgical procedure to obtain this end is bilateral subtotal lobectomy with excision of the isthmus of the thyroid gland. This procedure may be done either in one stage or by multiple stages. Economically, the fewer stages the better. The number of multiple-stage operations is decreasing with the increasing efficiency of the preparatory measures. In the 100 cases analyzed 78 had the subtotal thyroidectomy performed in one stage, while 22 required two stages. The decision as to whether a ligation of the thyroid vessels, a single lobectomy, or a bilateral lobectomy with excision of the isthmus, is indicated rests on the judgment of the internist and surgeon. The operative procedure should be short of taxing the patient's already toxic heart. The less the manipulation of the thyroid gland, the less is the acute hyperthyroidism reaction produced immediately after operation. When the operation is done in stages, the second operation is usually performed at an interval of seven days.

The type of anaesthesia is important. Local, nitrous oxide and oxygen, combined local and nitrous oxide and oxygen, and ethylene and oxygen are the varieties enjoying popular favour at present. It is felt that local without general anaesthesia is too great an ordeal for the patient. Local anaesthesia with nitrous oxide and oxygen is not necessary with the safer general anaesthetic, ethylene and oxygen, so suitable.

Further operative protection is given the patient by careful surgical technique. Gentle manipulation with a minimum of trauma and efficient haemostasis are important factors. It is also felt advisable to drain the cut gland surface with a small rubber drain for 24 hours. The patient is given one-third of a grain of pantopon before the ethylene anaesthesia is discontinued. The heart may require support.

Digifoline, camphor in oil, caffein-sodium benzoate are used. Intravenous therapy, or transfusion, may be given as an emergency measure on the operating table.

POST-OPERATIVE CARE

Immediate post-operative treatment.—A certain amount of shock and acute hyperthyroidism are taken for granted as a result of the operative interference. To combat these two factors, as a routine procedure, it is advantageous to give the patient a hypodermoclysis of 1000 c.c. of 5 per cent glucose saline solution, with 20 drops of Lugol's solution added. Also rectal fluids are given in the form of 250 c.c. of 10 per cent glucose saline solution, to which has been added 20 drops of Lugol's solution. The proctoclysis is repeated in three and six hours. As a sedative, one-third of a grain of pantopon is prescribed every three hours, if necessary, during the first 24 hours. If the patient's condition is critical, intravenous therapy of 5 per cent glucose saline, with 20 drops of Lugol's solution added, is substituted for the hypodermoclysis; or, better still, a transfusion is given. Digifolin, or caffein-sodium benzoate, may be of use to protect the heart. Ice-bags are placed around the head and over the precordium. Water is given in teaspoonful doses and cracked ice is allowed. The dressing is changed on the night of the operation day to guard against concealed haemorrhage.

General post-operative care.—The patient is allowed to move on his side within twenty-four hours and is usually sitting up in bed on the fifth day. He is allowed up on the sixth day and as a rule is discharged on the seventh or eighth day post-operatively. The hundred cases reviewed showed a total hospitalization of fourteen days, which included pre- and post-operative treatment. On the sixth day the first post-operative basal metabolic rate is taken. This averaged plus 7.5 per cent. This is further checked in two months' time, or more frequently if indicated. An endeavour is made to follow the patient for at least a year, and longer if it is practical.

Iodine is advised for at least two months following sub-total thyroidectomy. Ten drops a day of Lugol's solution is given on the second day post-operatively, and continued daily for the first month, and then dosage is reduced at

the rate of two drops a week during the second month.

Sedatives and tonics are prescribed as required. If there has been too much gland removed, thyroid extract is used. If there develops a tetany due to parathyroid deficiency, the blood calcium is raised by the use of calcium and Collip's extract (parathormone-Lilly is used).

Before the patient is discharged from the hospital a laryngoscopic examination is made, to determine the possibility of injury to the recurrent laryngeal nerve. If there is evidence of partial paralysis of the adductors, as a result of stretching the nerve at the time of operation, complete function will usually return in about two months. The patient is advised to overuse the voice as a therapeutic measure in these cases. Unilateral division may be compensated for, but bilateral division requires a tracheotomy.

Typhoid Meningitis in Two Months' Old Baby.—Typhoid meningitis is a rare complication of typhoid. There have been only thirty-three cases of typhoid meningitis reported in the literature. Statistics of the medical clinic of the Johns Hopkins Hospital show that out of 2,768 cases of typhoid there have been five cases of typhoid meningitis. In making a rather careful review of the literature, Panos S. Dukakis, Providence, R. I., has been able to find only thirty cases of general meningitis in infants under 3 months old. Out of these, three cases occurred in infants from 6 to 8 weeks old, the great majority being due, in the order of frequency, to *B. coli*, streptococcus, meningococcus, pneumococcus and the tubercle bacillus. There was only one case of paratyphoid meningitis in children under 1 year. This patient was 7 months of age and originally had meningococcus meningitis, but the paratyphoid bacillus appeared in the fluid during the course of the illness. Dukakis' patient was only 2 months old.—*J. Am. M. Ass.*, Dec. 31, 1927.

Distribution of Boric Acid in Human Organs in Six Deaths Due to Boric Acid Poisoning.—In six fatal cases of boric acid poisoning, occurring in infants, William D. McNally and C. A. Rust, Chicago, investigated the distribution of boric acid in the human tissues. The average percentages found in the tissues assayed (presented in an accompanying table) indicate that the brain and liver accumulate about the same and the higher percentages of boric acid; namely,

The associated toxic myocarditis improves following subtotal thyroidectomy, but the permanent damage to the heart remains. This calls for care by the internist. If the fibrillation persists for a period of two months quinidine is used. It is only rarely, with the combined use of digitalis and quinidine, that a heart is met which persists in fibrillating after thyroidectomy.

Other associated diseases are treated. The remaining foci of infection are eradicated. At first the patient's activity is limited by frequent rest periods which are gradually decreased until the patient's fatigability is reduced to normal. At the end of about a month or six weeks the patient is advised to take up his normal activities gradually.

There is no type of surgery in which pre-operative preparation, operative protection, and post-operative care are more definitely imperative and their results so gratifying as in thyroid surgery.

0.210 and 0.182 per cent, respectively. The bowel contained an intermediate amount of 0.102 per cent, while the heart, lungs, stomach, kidneys and diaphragm contained the lower percentages, 0.085, 0.0516, 0.0271 and 0.0124 per cent, respectively. The lower amount of boric acid in the stomach tissue (0.0358 per cent) may indicate that the acid was entering the systemic circulation through this channel by a process of osmosis rather than by means of the bowel (0.1023 per cent) tissue.—*J. Am. M. Ass.*, Feb. 4, 1928.

Penetration of Ultra-violet Rays Into Live Animal Tissues.—The penetration of ultra-violet rays through living animal tissue was studied by D. I. Macht, William T. Anderson, Jr., and F. K. Bell, Baltimore, in two ways: by means of the spectrograph, on the one hand, and by means of a thermopile, on the other hand. It was definitely established that penetration of ultra-violet rays through the living skin and other tissue is much greater than has hitherto been supposed. Some of the shorter ultra-violet rays penetrate through the living skin more deeply than the longer ultra-violet rays. A marked difference was noted between the living skin and the dead skin. White human skin is more permeable to ultra-violet irradiations than negro skin on account of the presence of pigment in the latter. These observations have been carefully checked and repeated.—*J. Am. M. Ass.*, Jan. 21, 1928.

Case Reports

CONSERVATIVE SURGERY IN EXTENSIVE TRAUMA OF THE LIMBS*

BY ANTONIO BELLEROSE

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Montreal*

Urgent surgery naturally brings forth much more of the unusual than does surgery done on persons who have been under observation, and in accordance with a technique decided on beforehand.

The following observations were made on a lad, sixteen years old, who was admitted into the Notre Dame Hospital, (in the service of Prof. Bourgeois), June 8, 1928, for an open fracture of the right forearm with luxation of the right elbow.

In placing a strap on a pulley which was worked by a motor, our patient's arm had become entangled around the beam by means of the belt which had caught his wrist.

CLINICAL EXAMINATION

There were traces of considerable hæmorrhage which had been temporarily controlled by a circular band and the patient was very pale.

Right forearm,—the right hand in pronation was thrown outward and the forearm was shortened. One noted the abnormal mobility between the middle third and the inferior third;



FIG. 1.—Lesions. A.—Humerus. B.—Fragment of olecranon. C.—Triceps brachialis. D.—Ulnar nerve. E.—Open fracture of the forearm. F.—Fracture of the epicondyle.

likewise at this point, one saw peeping through the tissues, the inferior extremity of the superior end of the radius. Therefore, the right arm showed a compound fracture of both radius and ulna at about the junction of the middle and lower thirds. At the elbow there was a deep wound, 12 to 15 centimetres long, reaching from the superior half of the inner aspect of the arm to the elbow, involving the teguments and the muscles. This exposed the lower end of the humerus which showed a fracture of the epicondyle, with the ulnar nerve displaced forwards, and behind, the triceps brachialis, to which was still attached a fragment of the olecranon; therefore, there were an open dislocation of the elbow, fracture of the epicondyle, and fracture of the olecranon.

OPERATION

The circular band being taken off, hæmostatic treatment was applied, and the wound cleaned. A longitudinal incision was made at the posterior aspect of the elbow, and the luxation was reduced, the position being maintained by placing the forearm in extension.

The tip of the olecranon was fixed in place by means of chrome catgut passed through the aponeurosis covering the ulna and the tendon of the triceps. The periosteum of the humerus was stitched together, the cubital nerve set back in its normal position, and the muscles sutured where possible. The wound was closed and drainage tubes inserted at the superior and inferior ends.

The fractures in the forearm were reduced, and the wound sutured and drained.

After a dressing had been applied with some pressure at the level of the elbow, the upper limb was immobilized by means of a splint.

POST-OPERATIVE COURSE

The wound in the elbow region healed well; the drainage tubes were removed after two days, and seven days later the sutures were taken out.

In the case of the forearm, progress was slower. About the seventh day an abscess developed, which was drained by numerous in-

* Paper read before La Société Médicale de Montréal, January, 1928.

cisions. Hard rubber tubes were inserted, which allowed us to irrigate with Dakin's solution. On July 4th, the forearm was placed in the flexor position under general anaesthesia; during the proceeding passive mobilization was applied to the elbow joint. On August 6th we liberated certain scars which rendered difficult the extension of some of the fingers, and removed a few small bony fragments.

Ever since that time, the patient has been treated three times a week at the department of massotherapy in the Notre-Dame Hospital.

Flexion of the elbow is possible beyond a right angle and extension is almost complete. Supination and pronation of the forearm are almost normal. Flexion of the wrist is complete and extension is limited. There is normal

adduction of the hand; the extension of the fingers is normal, the flexion is still slightly limited; the motions of the thumb are likewise slightly limited.

The above case proves that, with conservative methods, one may obtain good results in cases which seem to be in a desperate condition.

LARYNGEAL CARCINOMA*

By A. E. LUNDON, M.D.,

Montreal

This case is being reported with the view of emphasizing the fact that an early diagnosis of carcinoma of the larynx—which gives for many months only the symptoms of voice huskiness and later on hoarseness with, perhaps, an irritating cough—if followed promptly by operative interference of the type and to the extent indicated in individual cases, removes such cases from the derelict class in which they seem to have been placed for so many years. This case was referred to the Ear, Nose and Throat Department of the Montreal General Hospital by Dr. A. A. MacKay.

The patient was a man of 33, a window-dresser. The first examination was in April, 1927, at which time he complained of hoarseness for about two months, and intermittent huskiness of the voice, with an irritating cough, for several months previous to his appearance at the clinic.

Examination of his ears, nose and throat at that time showed a deviation of the nasal septum, causing no appreciable obstruction of the nose or other inconvenience; there were hypertrophied and infected faucial tonsils and an elevated ulceration on the anterior two-thirds of the left vocal cord, covered with a grayish slough and reaching up to but not encroaching upon, the anterior commissure. There was no clinical evidence of tuberculosis or syphilis, and the blood Wassermann, prior to and following a provocative dose of diarsenol, was negative.

A tonsillectomy under local anaesthesia was performed, and carious teeth were removed, to eliminate all foci of infection; and later, on the



FIG. 2.—Extension.



FIG. 3.—Flexion.

* Presented before the meeting of the Montreal Medico-Chirurgical Society, March 2, 1928.

understanding of consent to further operative interference if indicated, two sections for pathological examination were removed from the diseased area, within a week: one through a Haslinger directoscope which produced a specimen unsatisfactory to the pathological department; and the second, by the indirect method, which was reported upon as epidermoid carcinoma.

The case was treated surgically by a preliminary tracheotomy under local anaesthesia at the level of the thyroid isthmus, which was ligated on either side and incised at the mid-line. A few drops of 5 per cent cocaine solution in adrenalin were injected into the trachea and the usual routine followed leading to the insertion of a tracheotomy cannula. One week later, the patient was given an intramuscular injection of morphine sulphate, gr. $\frac{1}{8}$, 30 minims of a 50 per cent sterile solution of chemically pure magnesium sulphate, and 2 c.c. of 2.5 per cent novocain. This intramuscular injection was repeated, and one hour following the last injection after the infiltration of 1 per cent novocain, a thyrectomy was performed, the interior of the larynx exposed, and the left vocal cord, together with the underlying perichondrium, removed from the anterior commissure posteriorly as far as the vocal process of the arytenoid.

The patient appeared to suffer considerable discomfort as soon as work on the interior of the larynx was commenced; and therefore, from the point at which the removal of the diseased area was begun, the services of Dr. C. C. Stewart were enlisted for the insufflation of nitrous oxide gas through the tracheotomy cannula, the space between the cannula and the operation field above being packed to prevent the entrance of blood and secretions into the trachea. The troublesome oozing of blood which occurred was controlled by the use of surgical diathermy. The larynx was closed in the usual way without suturing the thyroid alae, and by bringing the surrounding musculature over the incised thyroid and suturing with catgut.

Little post-operative reaction occurred. The temperature rose as high as 100° for three days only; the pulse rate was at no time above 88 and respiratory rate never above 22. No oedema occurred which interfered in any way with swallowing or breathing; and, on the fifth post-

operative day the patient was up in a chair, on a regular diet, and the tracheotomy cannula had been removed. He was discharged from hospital nine days after the thyrectomy.

The patient now phonates almost perfectly, feels well generally, and there is nothing at the present time to indicate the likelihood of a recurrence of his carcinoma.

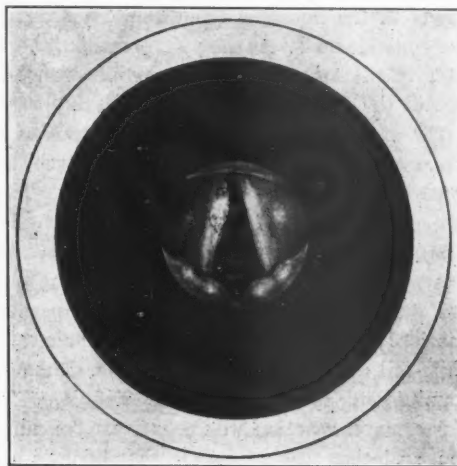


FIG. 1

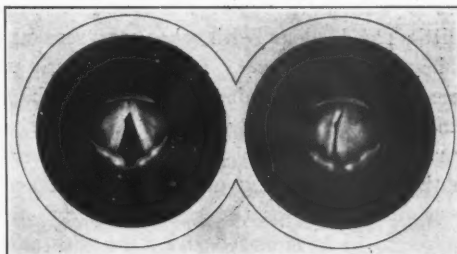


FIG. 2

FIG. 3

Fig. 1 gives an approximate idea of the condition of the larynx as seen originally. Figs. 2 and 3 show that a cicatricial band has formed which has filled in the space formerly occupied by the left vocal cord and which, through no good management of mine, resembles in an almost uncanny way the original vocal cord, only limiting the size of the glottis anteriorly, and showing only slight limitation of abduction or adduction as compared with the right cord, which obligingly crosses the mid-line to meet it in extreme adduction when called upon to do so.

ECTOPIC PREGNANCY, WITH DECIDUAL CAST*

By C. C. GURD, M.D.

Montreal

Miss D., aged 30, was seized with a sudden acute abdominal pain about 3.30 a.m., January 1, 1928. This pain was accompanied by a slight vaginal hæmorrhage. On getting up to inform others in the house, she felt faint, but did not lose consciousness. As the pain persisted, she was later in the day admitted to the Western Division of the Montreal General Hospital.

The history showed that up to the time of her attack she had been perfectly well; she had, however, missed one menstrual period. There was nothing else of note in her personal or family history. Her condition on admission presented no very striking features. The pulse was quiet and fairly strong, the temperature was 99.1°, and she was moderately pale. The white-cell count was 10,500 per c.mm. Bimanual examination revealed nothing definite. The Wassermann reaction was negative. On admission, an icebag was applied to the abdomen, and from the moment it was applied she felt quite comfortable, having no further abdominal pain. Two days later the vagina was found to contain a little blood, along with what was recognized to be a decidual cast. Laparotomy was performed the following day. On opening the abdomen a large quantity of free blood clot was found in the abdominal cavity, and on bringing up the right tube and ovary to the surface a fetus floated out of the mass. The left tube was found to be enlarged and filled with blood, and, on picking it up, dark blood was seen to extrude from the fimbriated end; examination showed it to be almost separated from the uterus. Both tubes and the right ovary were removed.

The after history was uneventful, except for the fact that on the 11th day after operation she developed a periurethral abscess of gonorrhœal origin.

The case is interesting for several reasons. First, it was an ectopic gestation occurring with the first pregnancy (there had, however, been gonorrhœal infection and she acknowledged having had sexual relations for several years).

* Reported at a clinico-pathological conference at the Montreal General Hospital.

Secondly, there was a well-developed decidual cast, the presence of which confirmed a diagnosis which up till then was not quite clear. Such casts are not invariably found in these cases, but the fact that the uterine mucosa shows this reaction gives greater support to the method, which is sometimes practiced, of curettage and microscopical examination of the scrapings, to establish the diagnosis of extra-uterine implantation. Third, the presence of blood found extruding from the *left* tube, strongly supports Sampson's theory of the origin of endometrial implants in the abdomen.

PARKINSON'S SYNDROME AS A SEQUEL OF TYPHOID FEVER*

By EDWARD S. MILLS, M.D.

Montreal

In a recent number of the *British Medical Journal* there appeared a review of an article by C. G. Nagtegaal entitled "Parkinsonism following Typhoid Fever" (*Nederl. Tijds. v. Geneesk.*, Nov. 12, 1927, p. 2079). In this article the author reports the case of a girl of fifteen years, who developed this syndrome following typhoid fever, the diagnosis of which was confirmed by a Widal test. He believes the case to be unique, as he was able to find no reference in the literature to any similar case, though practically every other form of nervous sequel had been described.

During the recent epidemic of typhoid fever in this city such a case came under our observation.

F. G., a young Englishman of 25, was admitted to the Montreal General Hospital on March 17, 1927, with the following complaints: headache, fever, loss of appetite and general weakness. He was a man of good habits, single, and had had no previous illnesses, except measles and mumps. The family history was good. He was taken ill on March 12th with headache and anorexia. Later, his nose bled and he became feverish. He walked to the hospital for treatment on the day of his admission. In the outpatient department it was noted that he had the characteristic appearance of typhoid fever. The expression was dull and lethargic.

* From the Medical Services of Dr. C. P. Howard.

The tongue was deeply coated. The spleen was palpable and the skin dry and hot. There were a few scattered rose spots on the abdomen. It was also noted at this time that there was some spasticity of the arm muscles, but this passed off when the patient's attention was diverted. *B. typhosus* was recovered from a blood-culture taken on the day of admission, and five days later the Widal test was strongly positive. Leucopenia was present on all occasions. The course of the disease was short but of moderate severity, the temperature range for the first week being from 102° to 106°. Delirium was never present. He was afebrile on the 18th day of the disease, and was discharged well on the 33rd day. During defervescence it was noted on one occasion that he still looked apathetic, and that he held the hands and wrists in a position not unlike that seen in Wilson's disease.

His first appearance at the out-patient clinic after discharge was on May 3rd, when it was noted that the face was mask-like and that he conversed in a monotone. There was now a coarse tremor of the tongue, and a *main d'accoucheur*. His only complaint was weakness. On November 3, 1927, he again reported with the complaint of pain in the small of the back ever since his last appearance. Clinical evidence of "typhoid spine" was lacking, and the x-ray report was negative. At this time definite increased tone was present in the muscles of both arms and legs, with exaggerated reflexes, and a coarse tremor which ceased somewhat on intentional movement. There was some stiffness of the neck muscles, and the face was more characteristic of Parkinson's syndrome. He last appeared at the outdoor clinic on January 27, 1928, when the pains in the back were somewhat better. The facial expression was fixed, the coarse tremor of the extremities was still present but the hands when extended were steady. Owing to his increasing disability, arrangements were made through the social service agency of the hospital for transportation to his home in England.

The presence of well-marked decidual cells in the uterus cannot be regarded from a medico-legal standpoint as evidence of recent pregnancy . . . there is also no essential difference, but only one of degree, between the corpus luteum during menstruation and during

The case is of interest only in that it shows that a mild grade of encephalitis may accompany typhoid fever. The actual onset of the process was suggested in the note made on the sixteenth day of the disease when it was noticed that the hands were held in an attitude suggesting Wilson's disease. A fortnight after his discharge from the hospital the other features of the Parkinsonian syndrome were noted. Eight months later he was completely disabled

AN ABNORMALLY LARGE INFANT

By W. R. LYNN GUNN, M.D.,

*McKenzie Hospital,
Fort Frances, Ont.*

The mother was a primipara, aged 23, of English birth, five feet seven and a half inches in height, and weighing 170 lbs. During her pregnancy she took no exercise and did no work, but her health was excellent. The father was five feet seven inches tall and weighed 146 pounds.

The expected date of confinement was March 7, 1928. On March 18th, labour was terminated after fourteen hours by forceps delivery. There was a laceration extending to the rectum with a rather profuse hæmorrhage. The child, a male, was resuscitated with difficulty. The weight, taken on the hospital scales, was 16 pounds; the length 24 inches; the circumference of head 14½ inches, (36 cm.); the circumference of the chest also 14½ inches. There was a paralysis of the left arm. The placenta, which was retained for an hour, was normal in size.

The baby lived six days and then, following a spasm of short duration, died suddenly. Up to the time of taking the spasm the baby had apparently been making very fair progress. The mother by April 3 had made a splendid recovery.

pregnancy. The only indisputable evidence of a recent pregnancy, therefore, upon which I would personally care to rely, is the existence of purely embryonic tissue—for example, syncytium or chorionic villi.—B. Whitehouse, *Brit. M. J.*, 1928, i, 655

Editorial

MAINLY ABOUT COMPLACENCY

AT a time when the medical profession may reasonably boast of an exceptionally large proportion of aggressive and fruitful workers, and when it is commonly recognized that its quality of service has reached a higher standard than ever before and is being rapidly improved, one hesitates to write about complacency. The urge to undertake so unpleasant a task comes out of the reading of Dr. Helen MacMurchy's paper on Maternal Mortality in the December number of the *Journal*. "Doctors do not take these cases seriously enough." "Maternal life is held in too light esteem." "Too little attention is given to pregnant women." These quotations are from letters which Dr. MacMurchy received from physicians.

A real philosopher, Mark Tapley, saw no virtue in cheerfulness except under conditions which the ordinary mortal would take to be contra-indications to a happy emotional state. He took credit to himself only when he could be cheery in the face of much adversity. Would he have found justification for complacency under any circumstances? Had Vesalius, Harvey, Jenner, Simpson, Lister—to mention but a few familiars—been of the complacent sort, they might have found life more tolerable, but we might have learned nothing of them or from them. And had complacency been a characteristic of all of our medical forebears, what would be the standing of medicine to-day? Complacency gives small incentive to progress.

There is much of instructive interest in the history of the obstetric art. Until within the last few centuries the practice was relegated to women, mostly crude and uncultured, some of them dissipated and immoral. In the popularization of the man-midwife, Harvey played a prominent part. The spread of humanitarianism led to a rapid increase in lying-in institutions, where the trained physician at first made a poor showing in competition with the Sairy

Gamp. Scarcely eighty years ago, pregnant women who sought admission to the Vienna Allgemeines Krankenhaus begged to be sent to the ward served by midwives rather than to the ward where physicians officiated. In the latter sepsis was rife; in the former it was unusual. Memories of those days persist; there are still some, uncritical in their acceptance of statistics, who attribute better results to the midwife than to the medical obstetrician.

Perhaps the complacency of physicians was not greater than that of the midwives, even when the latter were in their hey-day. At any rate, there were some physicians who were not content to believe that whatever is best. Here and there, now and again, a rebel against complacency strove for better things, and prophesied—in part. Thomas Willis had described puerperal fever, but he had been dead for nearly a hundred years before White, of Manchester, asserted his belief that this condition was caused by the absorption of matter. It was a worth-while observation, but not sufficient to disturb the general complacency of the profession in those days. Twenty-two years later, Gordon, of Aberdeen, declared that he had unquestionable proof that puerperal fever was due to a specific contagion or infection as readily communicable as the infection of small-pox or measles. This caused no great stir among the complacent ones. Nearly fifty years later Oliver Wendell Holmes published his famous essay. There was some reaction to this. Meigs was moved to discourse on the jejune and fizzleless vapourings of sophomore writers, and others expressed themselves in an equally *a propos* fashion. It was a hopeful sign. Semmelweis followed promptly with a miracle. He required students to wash their hands in a solution of bleaching-powder before passing from the autopsy room to the obstetrical ward of the Vienna Hospital for clinical instruction. There was an immediate reduction in the prevalence of puerperal sepsis. For a time

Semmelweis replied hotly to the animadversions of his colleagues. Then he became insane, but not before he had given free expression to his views relative to complacency. Not long afterwards, Lister, and Pasteur, and Koch were heard from, and then there was much perturbation. Even the most complacent were compelled to take measures for the prevention of sepsis. It was a great triumph, and everyone joined in the applause. Complacency is adaptable, and as easily satisfied by asepsis as by sepsis.

While it could no longer be said of obstetrical wards that:

'Infectious horror ran from face to face,
And pale despair,'

non-complacency was not yet satisfied with the risk which woman must run in the fulfilment of her highest function. Sepsis was still to be reckoned with. Even to-day it is the greatest single factor in maternal mortality. But other preventable factors, when taken together, are known to account for more deaths. To the importance of these Ballantyne, of Edinburgh, directed attention more than a quarter of a century ago. He pleaded for adequate ante-natal care. Many have fallen under his spell, and some of these proclaim that maternal deaths are almost limited to women who are not properly supervised during their pregnancies.

After carefully analyzing the statistics of Canada for the year which ended June thirtieth, 1926, Dr. MacMurchy tells us that the maternal mortality for the period approximated six per thousand living births. More than fifteen hundred Canadian women lost their lives in the endeavour to give children to our country. Many of them,

doubtless, were themselves complacent, and did not give either themselves or their physicians a fair chance. Many were denied the services of a physician. The number of these deaths attributable to "medical omission" is not stated. We trust that it is really very small. But a single death which may be fairly charged against complacency is a matter of concern to the whole profession. And here one recalls the medical opinions cited by Dr. MacMurchy, which suggest that there are still complacent members in the profession.

It is improbable that a class has been graduated from any reputable medical school within the last forty years which has not been made thoroughly aware of the importance of aseptic methods in mid-wifery. There must, therefore, be few practitioners who have not learned this at the feet of their medical teachers. Ballantyne's clarion call for adequate prenatal care has not gone forth to so many classes at college, and perhaps has not had the attention it should have had in the medical press. At any rate a much larger number of doctors fail to recognize the importance of prenatal care than are neglectful of aseptic technique. This discrepancy is to a considerable extent being reduced through the interest aroused by the establishment of prenatal clinics by both public and private health organizations. It may reasonably be hoped that with more general knowledge of the benefits resulting from watchfulness during the prenatal period, there will be less of what now seems like complacency chargeable to the profession.

W. H. HATTIE

ON THE VENTILATION OF OUR PUBLIC SCHOOLS

THE Ontario Department of Health has just published a small brochure on the subject of the ventilation of Public Schools, in which it presents the result of a study of the atmospheric conditions in two Ontario schools, by F. N. R. Bulmer and H. E. Rothwell, both of the Division of Industrial Hygiene.

Both of the schools which were investigated used a mechanical system of ventilation. One school, which had been recently

built, contained 12 rooms and used the mechanical system with power exhaust. The other school, built forty-five years previously, had 16 rooms and used the mechanical system with gravity exhaust. In both schools the windows were used at the discretion of the teacher as an auxiliary means of ventilation. The investigation was undertaken under official instructions from the Provincial Minister of Health and was evidently very carefully carried out. Observa-

tions were taken at five stations in each room during the autumn, winter and spring months, and the upper and lower level readings were taken at the same time at each station.

In their preface these health officers state that their previous investigations of the atmospheric conditions in buildings had been confined chiefly to industrial plants, where extreme variations of temperature, humidity and air movement were encountered; their observations, under these conditions, of the temperature, humidity and cooling power had been made by the thousands. From a study of their data they had come to the conclusion that the temperature alone did not give a reliable index from which to determine the efficiency of ventilation in industrial plants. The katathermometer with its dry and wet bulb readings however, in their opinion did afford an index which might be relied upon. In school rooms, however, where air conditions were more moderate and uniform, they considered that regular observations of the temperature gave a fair index of the ventilation.

In their report the old theory that the harmful effects of bad ventilation are due to the accumulation of toxic products in the air is discarded for the modern view which regards the physical condition of the air as all important. For good ventilation it is essential that the condition of the atmosphere should be such that the body can maintain its proper temperature with ease and comfort, by means of the cooling induced by radiation, convection and evaporation, without putting undue strain on the heat-regulating mechanism of the organism. The cooling power of the air depends upon three things, its temperature, its humidity, and the amount of movement in it. To obtain efficient and healthful ventilation two primary rules must be insisted upon; first, that the cooling effect of the atmosphere at the level of the head should be approximately equal to or greater than that at the level of the feet. When the cooling effect at the floor is greater than at the level of the head, this reversed condition tends to induce a constriction of the blood vessels of the feet and a dilatation of those at the head. The character of the secretion of the nose and throat is altered. The mucous membrane

becomes engorged and swollen, and its resistance to the action of bacteria in the inspired air is impaired. This predisposes to respiratory infections. Secondly, air should always be kept in gentle motion; even apart from its cooling effect air movement is necessary for its stimulating action on the nerve endings in the skin. According to Leonard Hill, the standard of comfort and efficiency for sedentary work is attained in an atmosphere with a dry cooling power of about 6, and a wet cooling power of about 18, as measured by a katathermometer. Professor Winslow is of the opinion that to have ideal atmospheric conditions in a schoolroom the temperature should be between 66°F. and 68°F.; there should be a moderate relative humidity, and a degree of air movement not excessive.

As a result of the investigation of atmospheric conditions in these two schools these officers report that in both the temperatures in a majority of cases at both head and foot levels were considerably higher than the optimum, rising in one school to 86.2°F. at head level, and 80.2°F. at foot level; at the other school to 82°F. at both levels. In school A the average temperature during observations was 71.1°; the average air-velocity was 28.6 feet per minute; the average cooling power 4.9. In school B the average temperature was 72.7°; the average air velocity 35.8 feet per minute; the average dry cooling power 4.7. An important point in the report was the fact that, notwithstanding the large number of observations taken, very little variation was shown in the velocity of the air, which remained almost constantly at a desirable figure. If the ordinary variation of humidity at a temperature between 60° and 70°F. is insignificant, it is clear that for a school using mechanical ventilation the temperature may be taken as an index of the efficiency of the ventilation. In both schools the thermostatic control was unfortunately often out of order. When the temperature of the inlet air was much above the temperature of the room air, that is, when the ventilation equipment was being used as an auxiliary heating system, the temperatures at the level of the head were higher than those at foot levels. The windows in the schools were not provided with deflectors of any

kind, and in consequence there was likelihood of draughts, which as a rule are objectionable. This likelihood was increased in some rooms by the location of the inlet and outlet registers. In winter the open window lowers the temperature at the foot level and may in this way do harm. It was noted during the survey that once a room becomes overheated in cold weather it is difficult by any means to cool it off so as to create comfortable atmospheric conditions without causing considerable discomfort from draughts during a teaching session. That is, if the pupils enter a room that is overheated in the morning, there is no means of cooling it until recess, when windows can be opened without any discomfort to the pupils. For this reason it is very desirable that the temperature of a room should not be high when the pupils first enter. A strict observance of the temperature should be kept. If schools are kept at a uniform temperature, the pupils will be able to dress suitably. But if there is a temperature of 74.5°F. one day, and the next day of 67°F., it is impossible for the parents to decide how the children should be clothed. According to Vernon, there is a difference of 20°F., other conditions being constant, between the temperature necessary for temperature equilibrium of the naked and the warmly clad body. This difference in the weight of clothing required demands an effort to maintain from day to day the same optimum temperature conditions in the school room.

These health officers conclude their report by emphasizing the statement that ventilation is a vital factor in the health of the child; and that insufficient attention is paid to the maintenance of efficient and healthful ventilation in schools and other buildings. More time and effort should be expended in determining the best means of achieving efficiency in this important field.

While it is acknowledged by all that the efficient ventilation of our public schools is an important problem, demanding the careful study of school boards, both in Canada and in the United States, the difficulties connected with its solution are manifold, as has been shown by the attempts made in several of the larger cities in New York State to come to some decision as to the

best method of securing effective and yet healthful ventilation in the school building. Early in 1926*, the Fresh Air Indoors Committee of the Public Health Association of Rochester, N.Y. invited the American Society of Heating and Ventilating Engineers to collaborate with them in conducting an investigation of the atmospheric conditions in their public schools, with the aim of conforming them to the highest standards of window gravity ventilation on the one hand, and mechanical ventilation on the other. In order that the conclusions arrived at should be generally approved, a National Central Conference Committee on School Ventilation was determined upon, and comprised representatives of the more important state and federal associations which have to do with health and ventilation. After several meetings of this committee, and a full discussion of the subject from every angle, they were only able to pass a resolution to the effect that the questions which have been raised in regard to the various methods of school ventilation would appear to be best settled by the study of the actual results on the health of the pupils; and, "whereas it would appear impossible for this committee to agree on analytical standards for judging of the efficiency of the ventilation, the different atmospheric conditions secured by the various different methods of ventilation should be studied by observing their effects on the health." The committee at that time reported that they were not prepared to submit any recommendation to the Board of Education, which might involve the expenditure of a large amount of money, until the several societies composing the conference council were agreed upon the best method for ventilation. At a later date, the committee rejected the use of the rating schedule proposed by the ventilating engineers, as being insufficient for their object, in that it was proposed to make certain physical conditions of the air the criterion of success rather than the influence of these conditions on the health of the pupils and their freedom from respiratory affections. When this resolution was published, the Superintendent of Buildings in Rochester, a leading member of the Engineering section, stated in a letter that he was unwilling to

* *Am. J. Public Health*, Dec., 1927.

adopt any standard for testing the efficiency of ventilation which would modify the standards at present in use in public schools. These call for a dry bulb temperature of 67° to 69°F.; a relative humidity of at least 50 per cent; and an air exhaust of about 300 cubic feet per minute. In reply to this a member of the committee wrote that they regarded the health of the child as the ultimate fundamental test, and if the ventilating engineers could not meet the other members of the committee on this basis, he saw no hopeful prospects of further co-operation. Results as shown in the studies of school ventilation in the cities of Newhaven and Syracuse confirm in an astonishing

degree the findings of the New York State Commission on Ventilation, that from the standpoint of the health of the pupils, as indicated by the incidence of respiratory illness, natural ventilation would appear to be superior to that accomplished by mechanical means under average conditions of operation. The New York Commission on Ventilation in a report states: "This preliminary study strongly suggests that natural ventilation has some inherent virtue which mechanical ventilation does not possess, or mechanical ventilation involves some harmful influence from which natural ventilation is free."

IMMUNITY AGAINST TUBERCULOSIS

PETROFF, in a recent comprehensive review*, holds up Gascoigne's crystal clear mirror to truly reflect and focus in miniature the multiplicity of data which have accumulated concerning immunity in tuberculosis *au fin de siècle*.

The problem is discussed under three headings, namely, the immunity due to: (1) Living virulent tubercle bacilli; (2) living avirulent tubercle bacilli; and (3) heat-killed tubercle bacilli.

Even at this date there are not lacking champions of the idea that the price of immunity in tuberculosis is infection, and that this can only be acquired by means of living virulent tubercle bacilli. Foremost of these is Selter† in Germany, who from animal experiments has satisfied himself on this point, and has vaccinated a score of children with small doses of living virulent tubercle bacilli. In America, Webb has reported vaccinating two children with small increasing doses, but the work has not been followed up. The opinion generally held is that the procedure is too dangerous.

With regard to the use of avirulent living organisms, many types have been used, namely, the saprophytic acid-fasts, the virulent forms attenuated in various ways, by the employment of heat, formol, etc., and finally, the latest member, Calmette's organism, B.C.G., which has been attenuated by growing a bovine culture on glycerine

potato bile over a thirteen year period, with monthly transfers to the same medium. The saprophytic acid-fasts have proved of no value, while the attenuated forms are to be considered, at least, potentially dangerous, although offering some degree of immunity. R. Kraus* and Selter confirm Calmette's animal experiments and report a relative immunity to virulent re-infection after vaccination with B.C.G., which the former considers due to a certain degree of virulence still retained by the B.C.G. organism, while the latter thinks the organism not sufficiently virulent to cause a high degree of immunity. In occasional instances Gerlach† could transfer the lesions in series, though on the whole the lesions produced with B.C.G. are non-progressive.

Finally, there remains the use of heat-killed tubercle bacilli for vaccination. In view of the fact that such a vaccine produces anatomical changes similar to the living forms, produces an allergic state, stimulates the formation of anti-bodies and establishes a definite but only relative immunity to virulent re-infection in his vaccinated guinea pigs, Petroff considers its use safer for preventive vaccination. He considers that the only way to stamp out tuberculosis is to get rid of the tubercle bacillus, which will not be accomplished if living organisms are used whether they be virulent or avirulent.

ARNOLD BRANCH

* *J. Am. M. Ass.*, 1927, lxxxix, 285.

† *Klin. Woch.*, 1927, xxiv, 1134.

* *Ztschr. f. Immunitäts.*, 1927, li, 230.

† *Ztschr. f. Immunitäts.*, 1927, li, 256.

A DISSERTATION ON DRUNKENNESS

WHEN is a man drunk? At first sight, this seems a simple question, and most people would feel that they could give a correct answer to it. Indeed, when confronted with a suspected case of drunkenness, the ordinary police constable believes that he is competent to make the diagnosis, and, as a matter of fact, he will be right nine times out of ten. But, it is the odd case that causes the difficulty. Always important, the matter has been much to the fore of late, owing to the great increase of industrial hazards and the growing familiarity with high-powered and delicate machinery. "Driving a motor car when drunk" is now a frequent charge in the courts. Hence, clear-cut ideas in regard to drunkenness are essential in order to prevent possible miscarriage of justice.

Cases have occurred, often enough, in which a suspected "drunk" has been put in a prison cell to sleep off the effects and has been found dead next morning—from cerebral hæmorrhage. All medical students are taught the importance of distinguishing between certain conditions that have a general resemblance to one another, in that coma is a common feature, and to differentiate them from acute alcoholism. Such are, cerebral hæmorrhage, epilepsy, uræmic coma, diabetic coma, and opium poisoning. Again, as recently happened in England, a person has been arrested and convicted of the offense of driving a motor car when intoxicated, and subsequently, on appeal, it has been proved that he was unjustly condemned, being a sufferer from an organic disease of the brain.

It is rather curious that there is, in England at least, no statutory definition of "drunkenness." High legal authorities have expressed differing views, notably, in regard to the question whether or not there are degrees in drunkenness. Some hold that there are. On the other hand, Mr. Bingley, the Marylebone magistrate, has decided that there are no gradations in drunkenness, and the Lord Chief Justice, also, has laid down the dictum that "Drunk means drunk." Nevertheless, many less exalted people are as strongly convinced of the

contrary. Everyone has heard in common parlance the terms, "happy," "maudlin," "fighting-drunk," "blind-drunk," and "dead-drunk." This can only mean that distinctions of degree are generally recognized. It can hardly be wrong, then, to recognize kinds and stages in inebriation, to which the adjective, "jocose," "lachrymose," "bellicose," and "comatose" would not be inappropriate.

Byrne's *Law Dictionary* states that "A man may be held 'drunk for the purpose of one offence, when he would not be held drunk for the purpose of another offence. The degree of intoxication which would make an engine-driver drunk if he were driving an express train would not make him drunk if he were walking along a country lane.'" Here, a new principle is introduced, that the concept of "drunkenness" should be framed in relation to the kind of occupation that the person is engaged in when under the influence of alcohol. There is much need of an authoritative definition of what constitutes "drunkenness," and of some reliable test for the drunken state. Sir James Purves-Stewart, of the Westminster Hospital, defines a drunk person as "one who has taken alcohol in sufficient quantity to poison his central nervous system, producing a temporary disorder of his faculties so as to render him unable to execute the occupation on which he was engaged at the time, thereby causing danger to himself and others."

In deciding upon any given case, the medical man who may be called in should first establish whether the person under suspicion has taken alcohol or not. This can be learned from the history and from the smell of the breath. The latter certainly cannot prove the fact of drunkenness but, at least, opens up the possibility. To infer more than this would be unfair. As Sir James Purves-Stewart remarks, even an archbishop, who has taken a glass of port with his luncheon, might be brought under suspicion.

The next question is whether sufficient alcohol has been taken to disorder the central nervous system and render the

person's reaction to his environment temporarily abnormal. Here is where the various tests for drunkenness come in. It is important to note that these tests are not tests for alcoholic poisoning as such, but for cerebral, cerebellar, and ponto-bulbar lesions, and such-like disorders. These, of course, can be produced by many causes besides alcohol. The flushed face, the staggering gait, the dysarthric speech, the altered mentality, are all familiar features. But more is needed. It is all-important to make a thorough examination of the nervous system, to establish whether or not organic disease is present. A full history will help. The state and reactions of the pupils; the eye-grounds; the knee-jerks; the muscular responses; co-ordination; speech; and mentality, should be examined. The urine should be tested for albumin, casts, sugar, and "acid bodies." And this does not exhaust the list. In case of doubt, time will tell. Acute alcoholism is temporary; organic nervous disease is permanent. There is no single clinical sign which is pathognomonic for alcoholic poisoning of the central nervous system, with the possible exception of the detection of alcohol in the cerebrospinal fluid, as Sir James points out. A positive finding in this particular probably indicates that a considerable amount of alcohol has been ingested. We know, for example, that the intravenous injection of arsenicals is followed by the appearance of arsenic in the cerebrospinal fluid, but in quite small amounts. But whether the vessels of the central nervous apparatus are more permeable to alcohol than to mineral substances we do not know. Before we can say much, it should be determined experimentally what proportion of the alcohol in-

gested can make its way into the cerebrospinal fluid, and with what rapidity; also, if there is any precise correlation between the amount of alcohol found in the cerebrospinal fluid and the clinical nervous manifestations. Of course, in practice, lumbar puncture is not always feasible.

One difficulty in the way, not hitherto referred to, is that, taking the capability of handling a situation as a standard, the line between sobriety and drunkenness is easily passed. This has long been recognized. As Horace remarks (*Ode xviii, Book I*)

"Monet Sithoniis non levis Euius (Bacchus)
cum fas atque nefas
exiguo fine libidinum discernment avidi."

And poets, traditionally at least, are supposed to be good judges in such matters. It is well known for example, that a person who has taken alcohol may be perfectly competent to perform an action safely and well, but in a moment, from the interposition of some extraneous factor, such as shock, surprise, or fear, may become incompetent and a menace. One moment he is sober: the next, drunk. Paradoxically, we may see this when a man who has taken alcohol, but is apparently sober, vomits; he may suddenly become drunk. Probably what happens is this. The vomiting eliminates much of the mucus adhering to the wall of the stomach and lays open a large absorptive surface.

Clearly, the conclusion is that when about to engage in some occupation that requires quick apprehension, good judgment, and prompt action, alcohol should be put to one side.

A. G. NICHOLLS

ETIOLOGY OF CERTAIN NUTRITIONAL DISTURBANCES DURING INFANCY

AT the annual meeting of the American Pediatric Society, held in Washington, in 1925, Dr. McKim Marriott presented a paper on the etiology of certain nutritional disturbances occurring during infancy.* In it he drew attention to the failure of the

view that some fault in the feeding of the infant provided a satisfactory explanation in all cases of nutritional and intestinal disturbance; enteral and parenteral infections appear in some cases to have an etiological relationship, a relationship which has been recognized by physicians for some years. The purpose of the present paper

* *Transactions of the American Pediatric Society*, 1925, xxxvii, 38-40.

was to point out an apparently definite etiological relation between certain streptococcal infections of the mastoid antrum with a nutritional disturbance characterized by severe watery diarrhoea, prostration, acidosis, rapid loss of weight, and a failure to retain fluid even when given in large amounts. In a group of twenty infants suffering from the symptoms described the mastoid antrum was opened under local anaesthesia and streptococcal pus was obtained. The operation itself caused little disturbance and in a large proportion of the cases there was almost immediate relief to the symptoms. The usual local signs of mastoid involvement, such as swelling, redness and tenderness, were absent. The tympanic membrane however showed some change in all cases; there was a persistent sagging of the posterior superior wall of the canal near its junction with the membrane. Dr. McKim Marriott said that while it was possible that a mastoid antral infection could clear up without operation, in many young infants there was an excessive folding of the mucosa in the attic, which in the presence of any infection was liable to completely close off the attic and antrum. Infections of the mastoid antrum with organisms other than streptococcus did not appear to give rise to the same systemic disturbances. He suggested that the streptococcus toxin exerted a specific action on the capillaries of the body, and especially on those of the intestinal tract, resulting in a condition of hydrolability which was characteristic. The most successful dietetic treatment had been a high caloric diet of undiluted lactic acid milk with a fair amount of corn syrup. In the discussion which followed, Dr. Jeans, of Iowa Children's Hospital, drew attention to the slight pathological changes sometimes met with, and also to the striking way in which the symptoms disappear after operation. A feature of this type of infection was its apparent limitation to the period of infancy. All his own cases had been under fifteen months.

In replying to several questions proposed

during the discussion, Dr. Marriott stated that the symptoms in these cases did not appear to be due to a septicæmia; blood cultures taken during life were usually negative. The diagnosis of mastoid involvement had sometimes to be made by exclusion. The operation was a simple one and did no particular harm, even if the mastoid was not found to be infected. Post-auricular drainage was a better term to apply to the operation rather than that of mastoid operation, as it differed greatly in severity from the operation usually required in older children. A Roentgenogram was of little value in these young infants.

This paper of Marriott's has given rise to a considerable amount of controversy. The position taken by Marriott has received the support of many paediatrists in the Middle West while the majority of those in the East question any direct etiological relationship. It is to be noted that Dr. Marriott has at no time advocated an indiscriminate opening of mastoids for persistent intestinal intoxication. Only when evident indications of some pathological condition is found on examination of the ear, in association with indications of severe nutritional disturbance which fails to react to appropriate dietetic and systemic treatment, should operative measures be adopted.

In increasing numbers paediatrists are coming to regard nutritional disturbances in the infant as in a certain percentage of cases due to some associated infection which must be treated primarily before we can obtain marked nutritional improvement even under the most correct methods of feeding.

The paper which we publish in our present issue is very timely, and presents many interesting facts which connect pathological lesions in the ear with systemic infections. The definite otitis present in some of his cases would appear, however, to be a different pathological lesion from the one to which Dr. Marriott referred in his paper.

R. R. STRUTHERS

MASSIVE ATELECTASIS

THE report of work on Massive Atelectasis before the American Association for Thoracic Surgery, recently in session in Washington, represents a real advance in our knowledge of this serious condition. By animal experimentation and actual experience on human beings, it seems definitely established that so-called massive collapse is due to plugging of the main bronchus on the affected side by thick tenacious mucus, and then the accumulation of mucus within the distal bronchioles. It was shown that immediately on aspirating the mucoid plug through a bronchoscope, thereby establishing an airway, large quantities of mucus were spat up, the patient's condition immediately improved, and radiographic examination, even as early as four hours after the use of the bronchoscope, showed the lung in expansion again. The report of cases by other members suggests that, if the patient can be made to cough violently, an airway may be established and the lung at once expands. This is accomplished by turning the patient on the good side with the head low and hitting him a sharp blow on the back over the affected lung. Apparently, in massive atelectasis there is an inhibition of the cough-reflex.

It is possible that post-operative broncho-pneumonia is a process allied to massive collapse, and may also be greatly benefited

by bronchoscopic drainage. Even lobar pneumonia may respond to such treatment, as suggested by Dr. Alexander Lambert, of New York, who has employed it in twelve patients.

Massive Collapse, better described as Massive Atelectasis, is a serious post-operative complication. Its incidence has been more widely recognized since Scrimger, of Montreal, brought it to the attention of the profession in 1920, before the meeting of the American College of Surgeons. While the condition usually clears up of itself within five days, the patient suffers great distress, and if he cannot be made to cough, and thus clear the bronchus, a careful bronchoscopic drainage is apparently indicated without delay. In addition, the possible relationship of atelectasis to broncho-pneumonia must be kept in mind, and it is possible that further evidence will show that early use of the bronchoscope at the onset of post-operative broncho-pneumonia may check the development of this serious complication.

Dr. Walter E. Lee, of Philadelphia, working in the clinic of Chevalier Jackson, and Dr. Pol. N. Coryllos, of New York, working at Bellevue Hospital, presented the reports independently. They deserve great credit for this contribution.

A. L. LOCKWOOD

Editorial Comments

PROFESSOR A. B. MACALLUM

In a recent issue of the *Journal* the announcement was made by the Governors of McGill University that Professor A. B. Macallum would retire from the chair of Biochemistry at the end of the present session. The *Journal* at that time took occasion to make a brief reference to the very notable career of this illustrious Canadian biochemist.

As his retirement takes place this month, the present would appear to afford a fitting opportunity to present to our readers a fuller account of the activities and researches of one who has taught the students of our two leading universities the intriguing mysteries of biochemistry for a period of nearly half a century, and who

has rendered yeoman service to the Dominion in the promotion of national industrial research.

In our previous notice we called attention to the many and great distinctions and honours which had been showered upon him during his long career. In 1884 he was appointed as Tutorial Fellow in Biology in the University of Toronto, after he had taken a course of special study in Johns Hopkins University. In 1887 he became Lecturer in Physiology, and in 1890 was made full Professor in that subject, and continued teaching both Physiology and Biochemistry until 1906 when these professorships were divided. From this date until 1918 he held the chair of Professor of Biochemistry in the University. In that year he resigned his

position in Toronto to become Director of the Research Council, a position which he occupied with much distinction until 1920, when he accepted the Chair of Biochemistry at McGill University.

During the past forty years his achievements have covered a large number of subjects. In 1888 he reported the discovery of the origin of hæmoglobin from the nuclear chromatin in embryonic red cells. In 1892 he demonstrated the presence of "masked" iron in the chromatin of every cell, and proposed the generalization that as hæmoglobin is derived from chromatin the latter must have respiratory powers. Between 1898 and 1908 he demonstrated by microchemical methods the exact localization in cells, animal and vegetable, of calcium, potassium, chlorine and phosphoric acid, and presented the results he had obtained in communications to the Royal Society of London. This was followed by a demonstration of the relation of potassium to adsorption in the cell. Remarkable cases of this adsorption were found in a number of forms, animal and vegetable. Potassium is not generally diffused in the protoplasm while sodium is diffused throughout the cell. After this Professor Macallum carried out a very interesting investigation of the relation between the inorganic salts of sea water and those in the tissues of jelly fishes, which led to a formulation of the origin of the salts in the blood plasma of vertebrates. In the lower marine invertebrates, which have a circulation not closed off from the sea water, the circulatory fluid is sea water. In those invertebrates with a closed circulation, which have been denizens of the sea since the Silurian, the circulatory fluid is practically sea water of to-day. In vertebrates the inorganic salts of the blood are in a concentration less than one-third of the concentration of those same elements of the sea water of to-day, but by ranging the concentration of the sodium, potassium, calcium and magnesium in ratios, with sodium as 100, there was revealed a similarity to sea water, with the same elements, except in regard to magnesium. From this followed the generalization that the salts of the blood plasma in their concentration are those of the sea water of the Cambrian or Silurian period. In that age the concentration of the salts in the sea must have been less than one-third of what it is in the ocean of the present day, and also the proportion of magnesium was greatly less than it is now. The factor in maintaining this ancient ocean concentration in the blood plasma is to be found in the kidneys of vertebrates, which rigidly control the inorganic composition of the blood plasma. The kidneys have rendered it possible for vertebrates to change their environment without changing the inorganic composition of their blood, whereas amongst invertebrates such a maintenance of uniformity in the

blood plasma is not possible, and, consequently, a high degree of evolution amongst invertebrates is possible.

This led to a study of the inorganic composition of the living cell, and it has been found that the proportion of the elements sodium, potassium, calcium and magnesium are utterly unlike those found in the blood plasma. Hence the conclusion that the organic composition of the cell harks back to a more remote geological age, to a time when the organism was unicellular, and when there diffused into it the salts of its environment. On the other hand the animal cell represents in its organic composition the sea water of a period much earlier than the Cambrian. We may therefore state that in the blood plasma we meet with sea water of the Cambrian period, and in the cell itself a sea water of a date many millions of years earlier.

Professor Macallum's service to the Dominion as chairman of the National Research Council was undertaken with the same enthusiasm shown previously in his private work. When the British Government in 1917 saw the urgent need for a better appreciation among all classes of the power of applied science, not only in war but in all pursuits, Dr. Macallum undertook to lead in Canada. The fact that he was selected for this work was one of the greatest compliments ever bestowed on a man of science in Canada. It is yet early to evaluate the full importance of the work performed by him during those three years of intensive effort in laying the foundations of our National Research Institute, but it is becoming more and more understood as the idea of the necessity of scientific research spreads from Dominion to provincial governments, and as private manufacturing establishments take up the conception as their own.

Professor Macallum has been honoured by many societies. In 1900 he was elected a Fellow of the Royal Society of Canada, and in 1906 a Fellow of the Royal Society of London. Honorary degrees were bestowed on him by the Universities of Aberdeen, Trinity College (Dublin), Yale, McGill and Toronto. American physicians have honoured him by giving him membership in their oldest leading scientific bodies. The British Association for the Advancement of Science honoured him with the presidency of the Physiological Section in 1910. He was appointed Herter Lecturer in New York in 1918, and Hatfield lecturer before the College of Physicians in Philadelphia in 1917.

While undoubtedly the greatest work of Professor Macallum has been accomplished, and his teaching work must be regarded as finished, his friends and numerous students will follow his remaining years with every good wish and will trust that opportunities for private research may present themselves for many years.

PROFESSOR ROBERT FULFORD RUTTAN

Robert Fulford Ruttan, M.A., M.D., D.Sc., F.R.S.C., was born at Newburgh, Ont., in 1856. His grandfather was Captain John Ruttan, one of the United Empire loyalists who left their homes in the United States at the end of the Revolutionary War and migrated to Canada, where they were given a grant of land on the Bay of Quinte. Dr. Allen Ruttan, his son, graduated from McGill in 1852, and began practice in Newburgh, which at that date was regarded as the county town of Lennox and Addington. The location of the Grand Trunk Railway, and a change in the personnel of the Government, made Napanee the county town. When the change was definitely determined upon Dr. Allen Ruttan moved thither. He was a very successful general practitioner, who made a reputation which extended, not only through the surrounding county, but as far as Kingston on one side and Belleville on the other. He represented the Newcastle and Trent division in the Ontario Medical Council for many years.

Robert Fulford Ruttan graduated in Arts from Toronto University in 1881, obtaining the Gold Medal in Natural Science, and in 1884 graduated in Medicine from McGill University, winning the Gold Medal in Chemistry. Following this, he went to Germany, where for two years (1885 and 1886) he carried on post-graduate work in chemistry under Prof. A. W. Hoffmann. On his return to Montreal, he received the appointment of Lecturer in Chemistry, under the late Dr. G. P. Girdwood, and in 1891 became professor when Dr. Girdwood resigned the Chair. In 1912 he became Director of the Department of Chemistry in the University. Under him the department was reorganized, its teaching consolidated, and graduate work and research developed. Eventually he became Dean of the Faculty of Graduate Studies, succeeding Professor Frank D. Adams.

Dr. Ruttan, from the very outset of his career, associated himself with the life of the university in an intimate and influential degree. He was for many years the Registrar of the Faculty, and always interested himself in student athletics. In his undergraduate days he was a successful long-distance runner and a leading cricket player. He was a member of the Canadian Olympic Committee in 1908, and was for several years President of the Royal Montreal Golf Club.

In 1895 he became a Fellow of the Royal Society of Canada, and in 1920 was chosen to be its President. He was appointed to represent Canada at the International Research Council held in Brussels in July, 1919. He was unanimously nominated by the various branches in Canada of the Society of Chemical Industry

of Great Britain for the post of President of that Society, and was elected to the position at the annual meeting held in Montreal in August, 1921.

Dr. Ruttan's activities in the field of chemical research have been varied and extensive. He took an active part in the organization of the Canadian National Research Institute, and has been employed by the Federal Government on many occasions to carry out special research work, in all of which he has been signally successful. He has always shown not only a capacity for original research, but has enthusiastically thrown his heart and soul into such work.

His students in every year have sung his praises. We are pleased to announce that his professional friends are presenting him with his portrait, by Alphonse Jongers, which will hang in the hall of the Faculty of Medicine.

In his retirement Dr. Ruttan will take with him the high appreciation and cordial good will of his colleagues and former students.

PROFESSOR J. J. R. MACLEOD

In the departure of Professor Macleod, head of the Department of Physiology in Toronto University, who has been appointed by the King Regius Professor of Physiology in the University of Aberdeen, in the room of Professor John Alexander MacWilliam, resigned, Canada at large, and the University of Toronto in particular, have sustained a great loss.

John James Rickard Macleod was born at Cluny near Dunkeld, Scotland, September 6, 1876, the son of Rev. Robert Macleod. Educated at the Aberdeen Grammar School, he entered Marischal College as a medical student in 1893, gaining the Fife Jamieson Gold Medal in Anatomy, and the Matthews Duncan Gold Medal in Midwifery. He received the degrees of M.B., Ch.B., with honours, in 1898, being at the same time awarded the Anderson Travelling Scholarship. He then studied in the Physiological Institute of Leipzig University, 1898-99. He was appointed Demonstrator of Physiology at the London Hospital Medical School 1900; in 1902, Lecturer in Biochemistry; and awarded the McKinnon Research Studentship, Royal Society, 1901. He obtained the D.P.H. of Cambridge in 1902. He was appointed Professor of Physiology, Western Reserve University, Cleveland, Ohio, U.S.A., in 1903, and occupied this post until 1918, being engaged during the later years with various war duties; also acting as Professor of Physiology in McGill University, Montreal, during part of the winter of 1916. He was appointed Professor of Physiology, University of Toronto, April, 1918, and Associate Dean of the

Medical Faculty 1921; Vanuxem Lecturer, Princeton University, 1928.

Professor Macleod was elected a Fellow of the Royal Society of Canada, 1919, and of the Royal Society of London, 1923; awarded the Cameron Prize of the University of Edinburgh, and (with F. G. Banting) the Nobel Prize in Physiology and Medicine in 1923. He received the honorary degree of D.Sc. from the University of Toronto in 1923, and that of LL.D. from the University of Aberdeen in 1925.

Professor Macleod was a member of many learned Societies, in Canada and other countries.

President of the Royal Canadian Institute, 1925-26, and of the American Physiological Society, 1922-23.

A man of enormous industry, he published between 1899 and 1927 a total of 130 scientific papers, besides a number of books and monographs of which "Physiology and Biochemistry in Modern Medicine," and "Recent Advances in Physiology and Biochemistry," and the articles on Physiology in the *Encyclopædia Britannica* are worthy of special note.

The name of Professor Macleod will always be associated in the minds of medical men with the subjects of carbohydrate metabolism and glycosuria, the elucidation of which he has done so much to promote.

The crucial experiments of Banting on the function of the islands of Langerhans placed the crown of certainty on one of a number of plausible speculations as to the origin of the internal secretion of the pancreas. The effective substance was called "insulin," following a suggestion of Schaefer's made years before. This signal discovery, and the brilliant team-work of Macleod, Banting, Best and Collip, in the elaboration of questions as to the nature of insulin and its physiological action, which established the discovery beyond a peradventure, caused the eyes of the medical world to be focussed on the Department of Physiology at Toronto University. The work done there, under the stimulating influence of Macleod, has stood the test.

Still in the prime of life, Professor Macleod, we trust, has many happy and productive years before him, and his further career in the University of Aberdeen will be followed too with interest by all those who know him and who appreciate good work well done. His many friends wish him success in his new field of endeavour.

SASKATCHEWAN'S HEALTH UNITS

For some years the medical profession has been urging the government to enforce more stringently the quarantine laws in the rural districts.

The establishment of rural health units is an advance step in this direction. Choosing the personnel of these units will be a matter requiring nice judgment. It is the hope of the profession that the medical director will be a man who has practised long enough in the country to have experienced the sensation of a call at two o'clock in the morning, when the thermometer registered 35° below zero, and the call is to a patient fifteen miles away who has not yet paid for the last baby.

On the other hand he should be young enough to remember the bacteriological technique and his recent training in immunology. His relations with the neighbouring practitioners must be sympathetic and helpful, never arrogant or superior. In short he should be chosen for his medical skill and tact, rather than for his political affiliations.

MEDICAL MEN AND THE LAW

Most medical men, at some period of their professional careers, have had the somewhat unenviable experience of being summoned as witnesses in courts of law. Perhaps this experience would be less of an ordeal if they had a clearer conception of their duties in this capacity, their rights, and their privileges. Forensic medicine has a place in medical curricula, but, owing to the more insistent demands of the other subjects it is treated with less respect and completeness than its importance deserves; and it must be admitted that, as time goes on, our memory of its details becomes somewhat hazy. Indeed, when the crucial time comes, the medical practitioner is apt to be found wanting. Yet, withal, it may be said that if he gives his evidence in a simple, straightforward, and helpful way, ever being mindful of the purpose for which he has been called, it is certain that he will retain his honour and dignity, and will receive from the Court that respect which one learned profession is usually ready to accord another.

Elsewhere in this issue, under the caption of Special Articles, will be found a very helpful abstract of an address by Mr. Roland Burrows, Recorder of Chichester, entitled "The Medical Practitioner in Relation to the Administration of Justice," to which the attention of our readers is directed.

In view of the above facts and the difficulty of obtaining adequate instruction in this very important subject, The Royal Institute of Public Health, in London, has taken the initiative in establishing courses of lectures, which have been running for the first two or three months of this year. Eminent medical and legal authorities have dealt with a considerable variety of relevant topics therein.

It is worth considering whether a similar

enterprise might not be undertaken with advantage in this country. Perhaps it could take the form of a special "Refresher" or "Summer" Course.

A. G. NICHOLLS

ANOTHER QUACK IN CANADA

We note the following statements regarding a "doctor" Orlando Edgar Miller, which appear in the *Journal of the American Medical Association* of April 14th.

The name of Orlando Edgar Miller is a familiar one to many of the *Journal's* readers who remember the man's history in the field of crude medical quackery. In the early nineties Miller was running a Rupture Cure concern with headquarters in Denver. The thing was stated to be a huge financial success, but in 1896 a grand jury brought in an indictment charging this Miller, together with the president and receiving teller of a Denver bank, with a misapplication of national banking funds.

Later on, this "Dr." Miller made Chicago his headquarters, and, according to the *Chicago Tribune*, exploited his medicated sand treatment as a sure cure for dyspepsia. Later on he organized what was described as a religious and philanthropic movement, known as the St. Luke's Society, to exploit a cure for drug addiction. While alleged to be philanthropic, the movement did not give sufficient indications to warrant the issuance of a licence by the Chicago Department of Health. The scheme apparently paid, for Miller kept moving into more expensive and more commodious quarters, until finally he rented an old hotel as a sanatorium. Later on, a fire took place in which thirteen of the inmates perished. Then came Miller's real "pièce de résistance," a consumption cure known as the International Institute for the treatment of Tuberculosis. Tuberculous patients were approached by the agents of the Institute and the extravagance of the claims made for the treatment was equalled only by the extravagance of the charges. Later on Miller went to Europe, going first to Paris where he was reported as having in-

fluent backing in the exploitation of his consumption cure. From Paris Miller went to London, where he interested the Duke of Manchester in his consumption cure business. Later still, he was arrested and charged with the manslaughter of a woman who died under his treatment. He was found guilty and sent to prison. In 1920 Miller was back in America as the affirmative apostle of intense individuality, and for a time delivered a series of lectures in Chicago, at which he was heralded as Orlando E. Miller, Ph.D., London, England. In December, 1924, the *New York Times* reported that two New York Hotels had cancelled Miller's lectures. In May, 1925, San Francisco papers reported him as a promoter of the Temple of Psychology, and shortly afterwards Buffalo papers reported the arrest of Miller on the charge of grand larceny. The *Vancouver Sun* of March 29, 1928, states that this Dr. Miller was being held in an immigration shed by the Canadian authorities who were deciding as to whether he should be deported. The *Vancouver Morning Star* of March 30th however reported that Miller had been released by the Canadian immigration authorities. The same paper carried a news item under a San Francisco date line to the effect that Orlando Edgar Miller had been indicted in San Francisco charged with the fraudulent sale of stock. It will be interesting to note how long Miller is able to stay in Canada.

TREATMENT FOR VETERANS

The informatory article submitted by Lt.-Col. Ross Miller, D.M.S., and published on page 733 of this issue is timely.

The *Journal* welcomes this opportunity of presenting to its readers the *status quo* of the veterans and the terms of relationship between the members of the medical profession and the Department of Soldiers' Civil Re-establishment at Ottawa.

Such information cannot but contribute to the welfare of all parties concerned.

A. T. BAZIN

Harold B. Wood, Harrisburg, Pa., says that many defects appearing on death certificates would be readily corrected by a better understanding by physicians as to the requirements and uses of these records. The death certificate, next to the birth certificate, is the most important official record made of man. It is of the greatest importance, therefore, that this record be made accurate and complete. In the matter of inheritance and other legal matters, the family of the deceased deserve protection by a correct certificate. A misunderstanding by physicians with regard to the requirements of

death certificates yields errors giving an opportunity for numerous criticisms.—*J. Am. M. Ass.*, May 12, 1928.

The diphtheria case and death rate for the year 1926 were the lowest ever recorded in the United States, the death rate being 7.5 per 100,000 and the case rate in forty-seven States 80 per 100,000. In 1927 there was a reaction, thirty-seven States showing an increase of 16.7 per cent over 1926 and 15 per cent over 1925.—*Brit. M. J.*, March 31, 1928.

Special Articles

THE DEVELOPMENT OF OUR KNOWLEDGE CONCERNING TUBERCULOSIS*

EIGHTH OSLER LECTURE OF THE VANCOUVER
MEDICAL ASSOCIATION

By C. H. VROOMAN, M.D., C.M.

Vancouver

PART II†

While practically all our modern knowledge of the pathology and the prevention of tuberculosis is founded upon Koch's discovery, our knowledge of treatment is largely based upon that slow and often inaccurate method, namely, clinical observation. The first man to advocate a method approximating our modern treatment was an Englishman, George Bodington (1799-1882). In 1840 he published an essay, "The Treatment and Cure of Pulmonary Tuberculosis," in which he says:

"Having mentioned the shutting-up plan in close rooms, the use of antimony and digitalis, if I add the use of demulcents, of blisters, of leeches, of plasters, etc., I shall have described the helpless and meagre system of medical treatment of consumptives in use at the present day." Having laid these methods aside as useless, he describes how a consumptive should be treated, namely, with a nourishing diet, wine for the stomach's sake, opium to relieve cough and give sleep, and above all, "the free use of a pure atmosphere" . . . the application of cold pure air to the interior surface of the lungs is the most powerful sedative that can be applied" . . . The patient ought never to be deterred by the state of the weather from exercise in the open air." He goes on to advocate the building of special institutions for the care of consumptives. He says: "The generality of the medical profession have not the opportunity of thus treating their consumptive patients! If they are to succeed they should have country houses in proper situations, well ventilated, provided with all the appliances and means, and where their patients should be under their own eyes and strictly watched and regulated in all respects as regards exercise, air, diet, medicine, etc. Or, there should be a certain class of practitioners who should exclusively pursue this practice as a distinct branch, to whom those in large towns should confide their consumptive patients, instead of sending them, as many now do, to take their chance, or prob-

ably fall into the hands of mercenaries at some distant sea port where they commonly die far away from friends and home."

These were wise words spoken sixty years ahead of their time. If Bodington had been able to establish these institutions, where he could have observed his patients, he would no doubt soon have eliminated exercise from his regime and substituted rest, and then he would have expressed the whole modern idea of the treatment of consumptives. He was, nevertheless, so severely handled by his critics that he had to abandon the use of his house for the treatment of consumptives and use it for a private insane asylum.

It remained for a German to demonstrate successfully the value of sanatorium treatment in pulmonary tuberculosis. It was in 1854 that Dr. Herman Brehmer, a victim of tuberculosis himself, opened at Görbersdorf, in Silesia, a few simple buildings for the treatment of consumptives. Following to a large extent the principles advocated by Bodington, he demonstrated that, by keeping his patients on a strict regime over a long period of time, he was able to cure cases of pulmonary tuberculosis. It took more than thirty years—a long time—before he convinced the profession of the soundness of his practice. In the meantime, his pupil Deitweiller, another consumptive, established another institution at Falkenstein, and insisted on the necessity of absolute rest. He was able to demonstrate results in treatment that had up till that time not been thought possible. Then Trudeau, fighting his lonely fight in the Adirondacks, was inspired to build "the little red cottage"—a building fourteen by sixteen, joined to a porch "so small that only one patient could sit out at a time, and that with difficulty." On February 1, 1885, there moved into it two factory girls, sent by Dr. Loomis, of New York, to Trudeau for treatment. "Frail, ill-clad and nearly dead with fatigue, to begin the great experiment . . . here in the depth of winter, with a wood stove, two cot beds and a kerosene lamp." This is the picture of the first sanatorium in America. Who could foresee from this small beginning that Canada and the United States, in less than forty years, would be spending millions of dollars in erecting palatial institutions, in order that all afflicted with pulmonary tuberculosis might have the benefit of the methods so successfully demonstrated by these early pioneers?

The ten years following the discovery of the tubercle bacillus by Koch were busy and fruitful years in adding to our store of knowledge

* Delivered before the Vancouver Medical Association, March 6, 1928.

† Part I. appeared in this *Journal*, May, 1928, p. 594.

about tuberculosis. It would be impossible in the time at our disposal even to sketch the numerous research studies that were undertaken, but much of the groundwork of our present knowledge is due to such men as Orth, Cornet, Baumgarten, Gaffky, Weichselbaum in Germany, Grancher, Martin, Nocard, Yersin, Metchnikoff and Richet in France, Sir Robert Philip in Edinburgh, and Trudeau at Saranac.

In August, 1890, Koch came out with a most momentous announcement. He had discovered a substance which would not only prevent tuberculosis, but would also cure it. It was a substance moreover that was harmless. "Medical men from all over the civilized world," says Trudeau, "flocked to Berlin to witness the effect of this remedy and to obtain some for their own use if possible. A thousand dollars was freely offered for a bottle which contained about a teaspoonful, and the substance could not be procured at that price from those who had been fortunate enough to procure the same. Crowds paraded the streets of Berlin, chanting hymns in Koch's honour, and shouting his name."

For some reason Koch refused to communicate the composition of his famous remedy, and it was not until January, 1891, that he announced that it was a glycerine extract of the dead tubercle bacilli, and the substance was called "tuberculin."

In November, 1890, Trudeau published in the *Medical Record* an article in which he stated he could not immunize animals against tuberculous infection by first inoculating them with the dead germs or with the filtered and sterilized cultures of the tubercle bacillus. "As was discovered later," says Krause, "there was no essential difference between Koch's substance and Trudeau's. Yet one man had made remarkable claims, while the other confessed that in his hands the substance did not have the desired effect. Trudeau published negative results and his paper was passed over without notice. Koch made startling, positive assertions and his announcement created a furore!"

It is not necessary to detail here the trials and final disappointment that resulted from Koch's premature announcement. Koch was possibly hurried to his conclusions by the hints given him from the Imperial government that it was time he made another great discovery. He was very human after all, even though a genius at research.

While tuberculin has never proved its value as a curative agent, its discovery has been of enormous aid in adding to our knowledge, for Koch demonstrated that while an animal who had never been infected with tuberculosis showed no reaction or ill effects even to enormous doses of tuberculin, an animal which had the slightest infection did show a very

definite reaction to the dead tubercle bacillus. In other words living tubercle bacilli make the tissues of its host allergic, so that a minute quantity of dead tubercle bacilli injected under the skin will cause a definite and specific reaction. It is this specific reaction that formed the basis of the early research work of men like Hamburger, Pirquet, Calmette and scores of others, and from it much of our present knowledge of infection and immunity has been derived.

Koch's Phenomenon.—Another most interesting observation that Koch made at this time was the difference in the reaction of animals to a second infection of tubercle bacilli. Koch describes the phenomenon as follows:—

"If a healthy guinea pig be inoculated with a pure culture of bacilli, the wound ordinarily closes and appears to heal from the beginning. But, toward the tenth or fifteenth day, there appears at the point of inoculation a hard nodule, which soon opens spontaneously, to produce an ulcer which persists until the death of the animal. Now, guinea pigs which have been infected four to six weeks beforehand and re-inoculated anew, behave very differently. No nodule forms at the point of re-inoculation, but from the next day or the second day this point becomes indurated and takes on a colour at first violet-red, and then blackish, over an area 0.5 to 1 centimetre in width. During the succeeding days the skin becomes necrotic. It soon sloughs and leaves behind it a superficial ulceration which heals rapidly and definitely, without the neighbouring glands becoming swollen.

"Thus, the inoculated tubercle bacilli act quite differently when under the skin of a guinea pig *already tuberculous* than when under that of a *normal* animal. This curious effect is not peculiar to living bacilli; it is found likewise with bacilli killed either by boiling or by chemical agents."

The significance of this observation was not appreciated at the time, but, some twenty years later, Calmette, Romer and others, repeating Koch's experiments drew attention to its importance and it forms now the fundamental basis of our ideas of immunity and prophylaxis of tuberculosis. It is now realized, by following the work of such men as Krause and Opie, that, almost all adult tuberculosis is secondary; that it is chronic and limited, because of the primary immunity conferred by the first infection. "Only the tuberculous are immune." This is the basis of the recent work of Calmette, which is referred to later.

In his investigations on the infectiousness of tubercle in 1868, Villemin made this observation, "Our rabbits that were inoculated with human tubercle did not suffer as rapid and completely generalized a tuberculization as those that had received inoculation from the tubercle

of cows." Thirty years later Theobald Smith of Boston announced that he had demonstrated that human tubercle and bovine tubercle were due to two distinct strains of acid-fast bacilli. At this time, Koch was extremely busy on experiments with animals, devising methods to immunize them against tuberculous infections. Misled by the fact that cattle could only with difficulty be infected with human tubercle, and also that human infection must necessarily begin in the lungs and be carried there by inhalation, Koch came to the conclusion that bovine tuberculosis was negligible as a cause of tuberculosis in humans. He made this announcement before the British Congress on Tuberculosis in 1901. This announcement was received with considerable incredulity, and led to the establishment of the British Royal Commission for the thorough investigation of the matter. The result was, that while bovine germs may be considered negligible as a cause of adult pulmonary tuberculosis, 22 per cent to 25 per cent of all tuberculosis in children under fifteen years of age was due to the bovine type. These figures have been substantiated by other investigators—Park, Krumweide and others. This has led to our well-known precautions as to the drinking of raw milk from untested herds, with the result that in properly protected communities tuberculous glands are becoming more and more of a rarity.

It would be fascinating, if it were possible, to dwell for a time on the work on immunity of Von Behring and his associates, but we must pass over this in order to review briefly the work of one who has introduced a definitely new method of immunization in humans. If one wishes to get a thorough knowledge of the tubercle bacillus he should read Albert Calmette's monumental work. Since 1913, Calmette and Guérin have been studying the effects of vaccinating animals with avirulent tubercle bacilli and producing thereby an immunity to further infections. These investigations were pursued under great difficulties at Lille, during its occupation by the Germans during the war. They were so far successful that after the war the French government gave Calmette "a nursery" of monkeys on one of the islands off the coast of French Western Africa. Here, monkeys were injected with the avirulent living tubercle bacilli, and afterwards put into cages with other monkeys suffering from advanced pulmonary tuberculosis. The vaccinated monkeys not only did not suffer any ill effects from the inoculation but they did not develop tuberculosis. Calmette was so satisfied that in 1921 he started giving new-born infants his protective dose of living tubercle bacilli, called B.C.G. "This is a race of tubercle bacilli obtained after thirteen years and 230 cultures, that have lost

their former property of producing tuberculous lesions. But this new race has retained the property of producing tuberculin and of calling forth the formation in the organism of tuberculous antibodies". . . . His method is to make a light emulsion, 400 million bacilli to the c.c. The infant on the third, fifth and seventh days after birth is given this dose in a small spoon mixed with milk.

On January 10th last, on the occasion of his being given by the French Government the highest grade of the Legion of Honour, Professor Calmette, in an address before the Academy of Medicine, reviewed his work in the preventive vaccination of the new born by B.C.G. (*Bacillus-Calmette-Guérin*). During the period between July 1, 1924, and December 1, 1927, 52,772 infants have been vaccinated. No harm has been reported to have resulted in any case. The most interesting feature of the report concerns infants born of tuberculous mothers and living in tuberculous surroundings. Of these there were 5,749 vaccinated; 3,808 of these were under one year of age and 118 had died; a mortality from all causes of 3.8 per cent. The ordinary infant mortality in France is 8.5 per cent. The mortality from tuberculosis among these 3,808 was 0.9 per cent, in contrast with a mortality of at least 25 per cent amongst non-vaccinated infants raised in tuberculous surroundings. The vaccinated contact-infants, between one and three and one-half years, numbered 1,941, with a total mortality of 21 deaths, of which 4 were presumed to be tuberculous. The mortality was 0.2 per cent, as compared with a mortality of 0.14 per cent for the non-vaccinated general population of the same age. Professor Calmette thinks that the immunity conferred by vaccination lasts about five years, so the child is tided over the period when it is exposed to severe infection. There is no evidence of harm having been done by the vaccine bacillus, or of its becoming virulent from long residence in the body.

Two Norwegian doctors (Heimbeck and Schiel) report using B.C.G. vaccine in adults, who gave a negative Von Pirquet reaction and so presumably had never been infected with tuberculosis. After vaccination these persons became Von Pirquet positive but showed no signs of disease. The B.C.G. is therefore probably harmless, and may afford a definite protection against tuberculosis.

What will be the permanent results of Calmette's method only time and observation will tell. It may be as epoch-making as Jenner's great discovery. "Only the tuberculous are immune to tuberculosis." It may be that Calmette has solved the problem, but how long the immunity he produces will last is not yet known. It is well for us at least to be awake on the subject.

To attempt in any way to review the enormous amount of research work that has been done in the last twenty-five years on tuberculosis is beyond the scope of this present paper. Even to name the distinguished men who have given their lives to advancing the outposts of our knowledge would fill several pages. The introduction of the x-ray alone has been instrumental in revising our views tremendously as to the incidence and pathogenesis of tubercle. From the first imperfect pictures, taken twenty-five to thirty years ago, to the beautiful stereograms that may be seen to-day in almost any x-ray laboratory the advance has been enormous. Because of the perfection achieved there is a tendency to regard the x-ray as the high court of appeal in all diseases of the chest. The clinician cannot shift the responsibility in that way to any laboratory method, and no one is more insistent upon the value of clinical methods of observation and judgment than those who are most expert in the interpretation of x-ray plates.

SUMMARY OF OUR PRESENT KNOWLEDGE OF TUBERCULOSIS

To attempt to summarize our present knowledge of tuberculosis is like trying to define a line of battle which is changing from day to day. Certain essential truths have been established, and more are being added day by day. Our views of to-day are modified by the discoveries of to-morrow, but certain things have been accomplished and certain remain to be done.

Infection, Immunity and Prophylaxis.—1. Infection with the tubercle bacillus is abundantly distributed throughout the civilized world. Most adults carry some living tubercle bacilli in their bodies throughout life. For most the organism remains an inoffensive parasite, and its presence is compatible with every appearance of health.

2. Massive infections occurring in the very young, or in adults who have never received a first infection, *e.g.*, where native races have not been in contact with the white man, this infection produces an acute miliary tuberculosis or acute pneumonic infantile type of tuberculosis that is almost universally fatal.

3. "The benign tubercle bacillus infections which remain occult or latent for years induce in those who harbour them a peculiar state of resistance to new infections. When the latter are superadded they call forth, according as they are more or less abundant or near together, a special intolerance for tubercle bacillus" (Calmette). The reaction of the infected organism to this secondary infection is a chronic inflammation with caseation, and may appear in almost any organ of the body, but it is most frequent in the too well known manifest

apical tuberculosis of adults. This secondary infection nearly always tends to heal. Opie states that he found healed apical tuberculosis in one in every five autopsies made on adults dying of disease other than tuberculosis, and he not only recovered living tubercle bacilli from these lesions but also living tubercle bacilli from the apparently healthy tissue around the healed nodule. Whether the superadded infections of adult life are due to living tubercle bacilli carried from the primary childhood infection by the lymphatic or blood stream (endogenous infection), or whether they are due to infections received from contact with other cases of tuberculosis (exogenous infection), is still to some extent a controversial point. Its discussion occupied a whole morning at the Washington International Congress on Tuberculosis in 1926. The truth seems to be that both methods are at times responsible, but the relative predominance of either method has not been settled. Exogenous infection of adults is, however, of sufficient importance that no element of prophylaxis can be neglected. Open cases of tuberculosis are a potential danger to all with whom they are in contact, but especially are they a danger to children. The studies of Opie are most illuminating on this matter. He found in a group of families exposed to open tuberculosis that 80 per cent showed an active tuberculin reaction before the age of five and 90 per cent at the age of ten; while in non-contact families only 23 per cent showed a reaction by the age of five and 62 per cent between the ages of fifteen and twenty years. Even of more significance was the fact that he found latent apical tuberculosis in 3.2 per cent of the adolescent children of contact families and none in non-contact families.

What then are the determining factors which make for chronic adult tuberculosis? The quantity and quality of the infecting organism, the pathways of entrance, and the condition of resistance the tissues of the host are in to repel the invasion of a parasite which is particularly tenacious of life. As Calmette says, "Each one battles against the infection with his natural weapons, which are his leucocytes, his lymphatic glands, his cellular ferments, and his hereditary or acquired qualities of resistance or intolerance to the bacillus. And these natural weapons are never adapted just in the same way to the same defensive function or in any two individuals similarly exposed." It is necessary to keep these principles in mind if there is to be any intelligence in our campaign against tuberculosis, whether it be the cure of the individual or the prevention of its spread in a community.

Diagnosis.—Boerhaave had a dictum that "no treatment but owes its efficacy to its timely application." In no disease is this more applicable

than tuberculosis, especially the pulmonary form. The timely application of treatment is dependent upon early diagnosis. The responsibility of this diagnosis still rests upon the general practitioner. The method by which this is made is still the laborious one of clinical observation and examination. The methods given to us by Laennec, together with the identification of the tubercle bacilli in sputum by the methods of Koch, will enable us in many cases to come to a conclusion as to the diagnosis. Combining with these the intelligent use of the x-ray few cases of early and manifest pulmonary tuberculosis should be overlooked. Yet, it cannot be too often emphasized that it is the patient and repeated application of these methods, together with good clinical judgment, that is required before coming to a positive or a negative decision. There is no one sign that is pathognomonic of tuberculosis, unless it be the finding of the bacillus, and then too often the disease is too far advanced for the timely application of our treatment. The Good Book speaks of "a wicked and slothful generation that looked for a sign, but to them no sign shall be given." Slothfulness on the part of the patient in coming to the doctor; slothfulness on the part of the physician in applying the methods bequeathed to us by our medical fathers, is the sin which has caused in the past, and is still causing, many lives to be destroyed that otherwise might be saved. It is not an easy matter always to decide as to the presence of early tuberculosis and in no disease does the aphorism of Hippocrates hold more true:—

"Experience is fallacious and judgment difficult."

Treatment.—It is hardly necessary to say that as yet we have no specific treatment for tuberculosis. Chemotherapy, in a most amazing number of combinations, has been tried and found wanting. Antiseptics, from carbolic acid to acriflavine, have been injected into the blood stream of suffering patients. Salts of copper, mercury, arsenic, and gold have all had their trial, with reported early success but with later disappointment. "The tubercle bacillus bore cheerfully a degree of medication that was fatal to its host." Tuberculin, not to 57 only but probably to 157 different varieties, has had at times its ardent advocates, but, while a useful drug in a certain limited class of localized disease, experience has proved it was not the panacea longed for. Serum-therapy and blood-transfusions have not been neglected, and the merits are extolled by those who found their experience largely on one case. Ductless glands have not been overlooked, especially of late the parathyroid. Inspired by the glowing testimonials of the detail man, pounds of this harmless form of protein have been consumed by poor

trusting patients, on the recommendation of equally trusting doctors who had neglected to acquaint themselves with the very essential physiological fact that little if any of the active principle of parathyroid is present in the desiccated gland, and that if it were present it would be destroyed by the juices of the stomach, and, moreover, if it were absorbed it would do no good anyway.

The treatment, however, that has stood the test of time, and has removed early tuberculosis from the list of necessarily fatal diseases to that of a very curable disease, is rest and fresh air. The routine, as carried out in a modern sanatorium, summarized by the phrase "chasing the cure," has given better results than any method so far devised. It is, unfortunately, too often true that both physician and patient mean by rest only diminished exercise. Rest to a patient taking the cure should mean absolute bed-rest so long as there are any active signs of disease, and afterwards exercise must be rigidly supervised. Fresh air to some still means much money spent in the search of a salubrious climate. Yet clinical results show that cures can be obtained just as readily at sea-level in England as in the mountains of Switzerland; that the results in Manitoba are quite as good as in California; sanatoria in Ontario discharge as many cures as those of Colorado; and that, while the air of Kamloops is beautiful and fresh, there is nothing deleterious in the air of Vancouver. To the laity generally, and to a large group of physicians whose knowledge is still based on tradition, the treatment of tuberculosis is thought largely to consist in stuffing the patient with illimitable quantities of cream, eggs, and rich foods generally. To them a fat patient is a cured patient, but to those who have had opportunities to observe fat does not mean fibrosis, and fibrosis of the tuberculous lesion is the end of our treatment. While it is necessary to supply sufficient nourishing food to satisfy the metabolic requirements of the body, it is neither necessary nor advisable to try and get the patient to assimilate an excessive amount of food. Rest brings lessened toxæmia, better assimilation, and, if the disease is at all controllable, the patient will naturally gain weight, but no amount of stuffing will stop a progressive and active tuberculosis.

Aside from the value of rest, the only other great advance in the treatment of pulmonary tuberculosis in the last twenty years has been collapse-therapy or artificial pneumothorax. Mentioned as a possibility over a century ago, it was first used in America by Dr. John B. Murphy of Chicago, in 1898, who tried it on a number of cases, but did not follow it up. It is to Fortanni of Italy to whom we are indebted for its introduction and demonstration as a

method of very considerable value. It is only since about 1913 that it has come into any general use. At first, it was limited to those cases which were strictly unilateral, but it has been found to be beneficial even where there was a fair amount of disease in the contralateral lung. Reports are already appearing of it being done in both lungs. Perhaps the most striking indication of the value of pneumothorax are the statistics published by Rist of Paris, in his paper given in Washington, 1926. He compares 759 cases treated by pneumothorax with 168 controls, *viz.*, cases which, though suitable for pneumothorax, either refused the treatment or could not be so treated because of adhesions. There was 30.5 per cent mortality among treated cases as compared with 53 to 54.2 per cent among controls. There were 52 per cent of the treated cases well patients, leading a normal life, and expectorating no bacilli, as against none among the refusals and 8 per cent able to work, but not bacilli-free, among the patients with adhesions. Pneumothorax is, therefore, an established method of treatment which is unusually valuable and much more widely applicable than was thought ten years ago. In cases where pneumothorax has failed, because of adhesions, thoracoplasty has become an established method. Archibald, of Montreal, has done much to put the surgery of pulmonary tuberculosis upon a sound basis.

Heliotherapy in the treatment of bone, joint and glandular tuberculosis has been proved by the work of Rollier, of Leysin, and Sir Henry Gauvain, of England, to be a most invaluable method of treatment. In pulmonary tuberculosis it is an adjuvant to be used with the utmost care, though in tuberculous enteritis and tuberculous peritonitis it has proved almost a specific.

Prevention.—After all, the greatest triumph in the application of our knowledge of tuberculosis has been in prevention. A glorious chapter it is in the history of public health, and, while the falling death-rate of tuberculosis in the last fifty years cannot altogether be attributed to those specific measures directed against it, there is no doubt in the minds of those who have followed the mortality curves of different countries that the present comparatively low mortality due to tuberculosis in English-speaking countries is largely due to these specific measures directed by the various anti-tuberculosis agencies. The essential principle of this campaign has been "to dry up the sources of infection or render them harmless." The treatment, or cure, of early cases in sanatoria and at home has dried up many sources of infection. The segregation of the infectious cases in our many institutions, and the education of the public in the hygienic care of the tuberculous, has rendered many sources of in-

fection harmless. The death-rate from tuberculosis has been more than cut in half in the last twenty years, and from holding first place as a killing disease tuberculosis has been reduced to fifth place. All honour is due to those self-sacrificing individuals who devoted their lives to search out the truth. We have mentioned some of the leaders, but there are also a vast number of privates in the army of science that have contributed their small bit and even now are forgotten by name. Let us also honour them, for theirs was the work, and their glory, fame, and reward was in that work.

The success that has crowned this campaign is due largely to that devoted body of men, both lay and medical, who have been responsible for organizing and administering the various societies and public institutions that have contributed to this glorious result. It is unfortunate that the general medical profession do not take more interest in these various agencies. Primarily inspired and established by medical men to give effect to knowledge gained at the bedside and in the laboratory, these agencies should not be entirely abandoned by the body of the profession to philanthropic laymen and physicians specially interested in tuberculosis and public health work.

"To journey happily is better than to arrive." We have been on a sort of "aeroplane flight" through the centuries, and have spent a short time in some very good company—Hippocrates, Galen, Leeuwenhoek, Stark, Bodington, Auenbrugger, Laennec, Villemin, Koch, Trudeau, Calmette. In their struggles to learn the truth, and in the after-struggle to get that truth accepted, we can appreciate Osler when he says—"Locke's remark, 'Truth scarce ever yet carried it by vote at its first appearance,' is borne out by the history of all great discoveries of the first rank. The times, however, are changing. It is interesting to compare the cordial welcome of the pallid spirochete with the chilly reception of the tubercle bacillus. Villemin had done his great work; Cohnheim and Salmanson had finally solved the problem of infectivity when Koch published his memorable studies. Others before him had seen the bacillus, but the conscious possession of the truth only came with his marvellous technique. Think of the struggle to secure acceptance. The seniors who lived through that instructive period remember that only those who were awake when the dawn appeared assented at once to that brilliant demonstration."

Tuberculosis is by no means a disappearing disease. Tragedies are daily seen, due to the ignorance and slothfulness of patients. Tragedies are also seen, due to ignorance and slothfulness on the part of medical practitioners. There is no one practising medicine who will not many times be confronted with

the problem of tuberculosis. Some tend to be over sanguine; others adopt the language of despair, and tend to abandon these unfortunate patients to their fate; some are slow to accept the knowledge already proved; some follow the false gods of quack-therapeutics and half-knowledge. It is a responsibility we owe our patients to acquaint ourselves with the present knowledge in this most important branch of our profession.

Sir Berkeley Moynihan's inspiring remarks to the surgeon are no less applicable to the physician who treats tuberculosis:—

"To give courage to those who need it, to restore desire for life to those who have abandoned it, with our skill to heal disease or check its course—this is our great privilege. Ours are not the mild concerns of ordinary life. We, who like the Happy Warrior are 'doomed to go in company with Pain and Fear and Bloodshed,' have a higher mission than other men and it is for us to see we are not unworthy."

THE MEDICAL PRACTITIONER IN RELATION TO THE ADMINISTRATION OF JUSTICE

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After premising that the existence of an adequate and efficient legal system is essential to any form of civilized government, the Lecturer went on to discuss the principles which actually govern the administration of justice, so far as they concern the medical profession. He proceeded: "I have stated that the problem of the medical practitioner is summed up in the word Treatment, and that of the Court in the word Liability. It follows that the function of the medical man differs. So far as concerns the patient his task is to diagnose, to decide upon treatment, and to see that that treatment is carried out. I am aware that that statement must be qualified because of the rights and means of the patient, but it will serve for my present purpose. When, however, the medical practitioner is called upon in connection with a case to be decided by the law, then his function is to assist the Court in coming to a decision. In the former case it is for him to decide to the best of his ability; in the latter case he is an assistant.

It has been suggested that it is absurd to leave the decision of medical matters to an unlearned Court, especially when twelve members of the general public, taken by chance, are called upon to decide difficult points upon

which experts differ. There is a short answer that in matters of crime at all events the fixed policy of this country is that in all cases, save minor offences, the question of guilt or innocence shall be decided by a jury. The case of a medical problem is only an example of many difficult scientific and social problems that are thus submitted, and there is not such a distinction between the medical and other scientific questions as would demand separate treatment. Another, and perhaps better, answer is that the medical problem is never the sole question in a case, and the decision must be upon the whole facts. The engineer and the chemist, among others, are in exactly the same position. But, whatever the reason and whatever the justification, there is the actual working of the judicial system whereby the medical man is not entrusted with the duty of deciding any point of medical knowledge or practice that may have to be decided in an action or prosecution.

I therefore turn to examine the methods by which the medical practitioner carries out his duty of assisting the administration of justice. He may be called upon in one or two capacities: (a) as an assessor, and (b) as a witness.

An assessor is not a judge. He does not decide. He, of course, hears the evidence and makes up his mind, and is under the judicial duty to be fair and impartial, but his function is to advise. The Court can, and in a few cases has been known to, disregard the assessor's views. An assessor comes late upon the scene, and the cause of justice cannot dispense with the knowledge and assistance of those who were called in at the material time when medical attention was needed. They necessarily come before the Court as witnesses.

Now, a witness is always called upon by one or other of the parties to the litigation. It is true that in civil actions the judge can with consent call a person to give evidence who has not been called by either party, and of course once a witness has been called, the judge can always recall him, but, when all is said, it is a fixed principle in this country, that a witness is called by one or other of the parties.

There is, however, one principle which governs all witnesses whoever they may be, and that is to tell the truth. That is a duty which they owe both to the State and also to themselves. The fact that a witness called for one or other of the parties does not involve any exception to or mitigation of that great principle. In that sense, and it is a very real one, all witnesses are witnesses of the Court, indeed of the State. They certainly are not partisans and should refuse to act as such.

There are two classes of witnesses, *viz.*, the *witness of fact* and the *expert*. The former is one who has observed some fact in issue, or relevant

to the issue, and his duty is limited to informing the Court of the events and circumstances which he has perceived himself. As it is sometimes put, his evidence must be limited to what he knows of his own knowledge: he must not repeat what he has been told, and the limits within which he may inform the Court of his inferences and opinions are very strictly defined. The expert on the other hand is a man with special skill and knowledge who is called in to assist the tribunal in cases where the evidence of witnesses as to fact is not sufficient.

The medical practitioner often occupies a position somewhat midway between the two classes of witness. He has been called in to attend to a patient and to some extent at least he is a witness of fact. At the same time the meaning of the facts which he has observed is one which calls for his special knowledge and therefore he is not limited to stating those facts: he is in fact expected to give his opinions based upon those facts. I have often sympathized with a general practitioner who has been called upon to give evidence when he has attended a patient. He is treated and rightly treated as an expert in the true sense, *viz.*, that he is not a mere witness of fact, but he is also sometimes, unfairly, treated as being an expert in another sense—and he does not claim to be an expert in that sense—he is in effect treated as an expert in that particular branch of medical knowledge. Moreover, sufficient allowance is not always made for the circumstances in which he was called upon to give his services. Often there is no time to make a detailed examination or to form a definite opinion. In an emergency the immediate problem is frequently to apply the treatment imperatively demanded. He must act at once on the instinct that is acquired by a man of training and experience without seeking to perform the processes of examination and diagnosis which seems so obvious when one is discussing the matter in the calm and leisurely atmosphere of the Court of Justice. Here it is that both Court and witness may be wrong in failing to give due attention to the fact that at the time the witness' task was to apply the appropriate treatment, and that his task is now different. Much of the friction that occurs would be avoided if this change of function received more attention.

I find that much sentiment is caused by the cross-examination of the medical witness. I do not mean that the objection is to the manners of Counsel—though on occasion one does meet with some cases where Counsel appear to have over-stepped the limits of decorum—but to the fact that the medical witness should be cross-examined at all. I do not think that there is any strong ground for this feeling as things are at present. A witness is called by one party. The other party must in

fairness be allowed an opportunity of checking the accuracy of the evidence given on behalf of the other side, and as I have before intimated, there is nothing which in principle differentiates the medical from any other expert in this regard. Cross-examination is an advantage to the witness who is truthful and competent. It enables him to explain, to amplify matters which have been shown to have been too curiously dealt with. Counsel is in such matters only a layman, and his questions may indicate that the evidence of the expert has conveyed a wrong impression, which he can now correct. Indeed, no one who has cross-examined a medical witness can fail to realize what an enormous advantage the witness has over Counsel.

The question now arises what medical men are to do when their duty towards their patients appears to conflict with their duty to the court. It is impossible to lay down general rules, save that no medical man can lend himself to the commission or concealment of a crime. In regard to the case where a medical man is asked to give evidence which would reveal matters of confidence between himself and his patient;—the duty to preserve one's patient's secrets is an important one, not lightly to be set aside. The rule has been laid down that no medical man can refuse to answer a relevant question on the ground that it would violate professional confidence. In other words, the cause of justice is paramount, and in cases of conflict overrides any other duty.

The situation may arise in different ways. If a medical man has been called as a witness on behalf of his patient, I do not think that anyone would claim that he ought to confine himself to such matters as further his client's interests, and refuse to answer if he is cross-examined upon other, but nevertheless relevant, matters which would tell against his patient. In such a case, though he probably would be well advised not to volunteer such information, his patient has elected to put him in the witness-box and must put up with the consequences. Indeed, I do not off-hand call to mind that any comment, adverse or otherwise, has been made as to such a case.

Again, in criminal matters, the duty to give evidence often leads a medical man into the box to give evidence against his patient. Here again it does not often happen that objection is taken. A medical man is called in to attend a young woman. He finds that she has recently given birth to a child. That child is not forthcoming. The discovery of the confinement may lead to a charge—whether murder, manslaughter, infanticide or concealment of birth does not matter—invariably the practitioner is called to give evidence for the prosecution.

In civil matters, the situation is different, though the problem is the same. There is a dispute between parties, say a divorce suit, and the medical man employed by one party is called upon to give evidence having been subpoenaed by the other party. This circumstance presses with peculiar hardship upon the general practitioner. He is in a highly confidential position and suspicion that he may have betrayed his patient's confidence may easily do him very great harm. This question has been discussed by high authorities, both legal and medical, and those who take one side or the other cannot be convinced by the arguments against their view. I have said sufficient, I imagine, to indicate my feeling that there is no sufficient case for amending the present rule, which is: That a medical man who is called upon to answer relevant questions as to his patient is not entitled to refuse to answer. The rule finds its justification in the principle that it is in the highest interests of the community that persons who can give evidence on matters in issue or relevant to any issue shall do so. There are cases where any relaxation of the rule would lead to the perpetration of a fraud.

My advice to a medical practitioner who is called upon to give evidence is, first of all, to remember that his primary duty both to the Court and to himself, is to be accurate. He is called upon to assist, in a very real sense, in the administration of justice, but his assistance is regulated by the rules of procedure and obtained by persons who as a rule are skilled in those rules. He should know in outline what the case is about, so that he shall have some idea of the way in which his evidence will assist the Court. Then he should carefully consider how far his evidence consists of observed facts and how much of inference from those facts. He ought to bear in mind that inference glides easily into opinion and opinion into hypothesis. I think every expert should confine himself, at all events in the first instance, to facts and to inferences which can with certainty be based upon those facts, leaving the less certain inferences and his opinions to be given, if demanded. A witness is in a strong position who says 'I have observed certain facts. It follows from those facts that such and such a state of affairs exists, or that such and such a conclusion must be drawn,' and is prepared to justify those facts both positively and negatively, i.e., not merely that he has observed them, but has established the non-existence of other facts which, if they existed, would affect the matter. If his opportunities of observation have not been sufficient to enable him to draw one out of several possible inferences, then a frank statement upon the matter will do him no harm—unless he is woefully negligent or unskilled—

and he should state his own inference, not as a certainty but as an opinion.

If he is pressed further and invited to express his opinion upon matters where opinions may differ, then if he does so openly and avowedly, he is but doing his duty.

He must, of course, expect to be challenged by the opinions expressed in works of authority, and should therefore make himself acquainted, at least generally, with such works, but he should avoid a constant error, viz., that of relying upon works of authority and not upon his own observation and skill. Upon such a question as virginity or live birth it is easy, by paying too much attention to the printed book and too little to the facts of the actual case, to give evidence in so uncertain a manner as to render less than due assistance to the Court, and even to produce the impression that, apart from the books, his opinion is of little or no value at all."—Abstract from *The Journal of State Medicine*, 1928, xxxvi, 125.

TREATMENT FOR VETERANS

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Department Soldiers' Civil Reestablishment,
Ottawa*

In order to correct certain misapprehensions the following facts are published in the interests of all concerned—the veteran, the department, and the medical profession of Canada.

Under the Pensions Act, as it now stands, every man who was in uniform is entitled to treatment and hospitalization, if necessary, provided:

1. He was wounded.
2. He had an accident or illness while on service.
3. He had a pre-war disability which was aggravated by service.

His eligibility to come under the above classes, and the degree to which he is disabled, is decided by the pensions examiners, who are detailed for this work in each province, and whose findings are reviewed by the Central Board at Ottawa.

Pensions are only granted for disabilities traceable to war service, and not for post war disease, nor for conditions which arise in consequence of advancing age.

The Department maintains eight hospitals of its own, and has contracts with nearly a hundred civilian institutions for the treatment of the disabled veteran. It also has some hundreds of medical representatives scattered throughout the Dominion for local treatment. As far as possible these medical representatives are themselves returned soldiers, and, therefore, are conversant

with the needs of the veteran. These medical representatives are paid according to a schedule of fees, which is modelled on the schedules of the Workmen's Compensation Boards for the provinces.

When a veteran needs treatment, the regular procedure is for him to apply to the nearest medical representative of the department, who should inquire whether the man has a pension, or has had one in the past, and, whether the present complaint pertains to the pensionable disability. If the eligibility has been established, the veteran is then given local treatment and whatever medicines he needs. Or, if the trouble is more serious, and is liable to be prolonged, transportation is given to the nearest Department of Soldiers' Civil Re-Establishment hospital.

Appointments of medical representatives have always been given wide publicity by advertisement in several issues of the local newspapers at the time of the appointment, and it is assumed that the veteran knows where the nearest medical representative is located. However, to provide for emergency, or for the temporary absence of the medical representative, the department recognizes, and will pay, any doctor for the emergency attendance if the veteran is an eligible case and the emergency is proved. It is also assumed that, in the course of ordinary professional courtesy, the emergency doctor will notify the regular medical representative at the earliest possible opportunity, and, in this way the department will be informed of the action taken and of the seriousness, or otherwise, of the case in point.

The Department cannot, under the law, become responsible for the payment of continued services or for supplies of medicine unknown to or unauthorized by the nearest Unit Medical Director, so that this point involves notification within a reasonable length of time of the commencement of the treatment. Many of the troubles in the past were due to independent action on the part of both veteran and doctor, and disappointment when the department refused payment of bills incurred under no supervision by the properly constituted authorities.

The department feels that adequate opportunities have been afforded and are readily available for supervised treatment, and that it is not unreasonable to ask both veteran and doctors to comply with the regulations. It will be found that most veterans know quite well what their disability is, and whether they are eligible for treatment, and they can always show a copy of their last pensions board in verification of their claim. In the very much smaller number of cases where, possibly, the eligibility has not been conceded as yet, or whose cases are still before the Appeal Board, the Department feels that the local doctor will not and does not

allow any worthy ex-soldier to suffer on account of want of treatment, and, if looked at from a monetary standpoint, the chances of recovering pay for treatment given are, to say the least, better than from the average civilian office practice, because, in the event of subsequent eligibility being proved, retroactive payment is granted, always, of course, providing that notification had been given that the veteran was under treatment. Emergency cases in which there is a reasonable doubt involved as to eligibility are invariably given the benefit of the doubt and a period of hospitalization is granted for observation.

There are some minor exceptions to the above remarks, but, on the whole, they are intended as a brief summary and a reminder to veterans and physicians that the easiest way and quickest way to get treatment and results is to follow the regulations laid down, and thereby everybody concerned will be better satisfied.

THE TREATMENT OF MEASLES WITH CONVALESCENT SERUM

In our May issue reference was made, under the heading of Provincial News,—New Brunswick, to the prophylactic use of the serum of convalescent measles patients in the case of contacts. This procedure was tried out with success at an orphanage in Saint John.

The following editorial will prove of interest in this connection.

"The lead given some ten years ago by the French physicians Nicolle and Conseil in the prophylaxis of measles with convalescent serum has since been followed by other workers, including Degkwitz, Zimmermann, Debré with Joannon, and Ravina on the Continent; and Zingher, Park and Freeman, Haas and Blum in the United States of America. From the published results of these various observers it seems evident that we now have a promising auxiliary weapon of defence against measles. The injection (according to age) of 6 to 10 c.c. of convalescent serum, collected at least five days after the patient's defervescence, will, in a large proportion of cases, prevent an attack if administered within five days of exposure. Furthermore, inoculation after the seventh day of exposure does not as a rule protect; but in such cases the disease appears in an attenuated form, complications very rarely occur ("sero-attenuation"), and an active immunity results. In this country little information has hitherto been published, but Miller and Smith of Harrogate and Benson in Edinburgh have recorded successful experiences of the treatment in small epidemics.

The question arises, therefore, whether an extended trial of the method in this country

should not be encouraged, and, if so, how. It may be said at once that, even if such a consummation were desirable, the prevention of every case of measles throughout the country is not a practicable proposition, and any attempt at wholesale immunization of susceptibles is out of the question. But in orphanages, convalescent homes, schools, and other institutions where a large proportion of the inmates are children the method should prove of great value; in hospitals also serum prophylaxis would usefully meet the difficulties when children are exposed to a case of measles developing in the wards; and in private practice (where R. P. Forbes and Berryman Green of Denver suggest the employment of "family donors") it is often important to protect one or more members of the family for whom, by reason of some frailty or because of tender years, an attack of measles is fraught with special dangers. It is, indeed, on behalf of children under the age of 5 years—who contribute a very large proportion of the deaths caused by measles—that these new measures, as suggested by W. S. C. Copeman and others, could most profitably be employed. By postponing the incidence of the disease, or in other

cases modifying the severity of the attack among children in this age group, we should reduce the risk of serious complications and might expect to achieve a considerable reduction in the mortality from measles.

One of the practical difficulties experienced hitherto has been the inadequate supply of serum for emergencies. In Paris, Brussels, and New York this difficulty has been overcome in part by the establishment of central depots where the serum is collected and kept ready for distribution. . . .

It should be added that some promising work is being carried out in the use of animal serums. In America encouraging results are reported by Tunnicliff and Hoyne in the use of goat's serum immunized with the green-producing measles diplococcus; more recently in Italy Pontano and Alba have observed that normal horse serum is as effective as convalescent serum. Should, therefore, a reliable animal serum become established and be put upon the market, many difficulties in the collection of convalescent serum, and some of the popular prejudices against it, would disappear."—Editorial, *Brit. M. J.*, 1928, i, 189.

THE G.P.

Entrenched at his desk, a "Court of Appeal"
Briskly concealing how tired he must feel,
Energetically nodding, as though with each
word,
His opinion and yours most fully concurred,
"Lister, M.D.," from nine until four,
Must be fully convinced that life is a bore.
The patients appearing, though different in
name,
Have feelings and symptoms most sadly the
same:
Whatever they say, in a whisper or roar,
"Lister, M.D." has heard it before.
But patiently trying their ills to abate,
He's working and testing both early and late,
To find for poor humans relief from their pain—
Eternally at it—it's "All in the Game!"

—Jessie Chestnut

Feeding in Dysphagic Conditions: Efficient Method.—Howard Lilienthal, New York, describes a simple method for insertion of the Einhorn duodenal tube. A long ureteral catheter is threaded into the duodenal tube as far as the little metal capsule. The tube is then rigid enough to be passed easily through the œsophagus and into the stomach. Once the tube is in place, the catheter is withdrawn and

food may at once be given. Even when the patient has vomited everything taken by mouth, liquids instilled through the tube are retained. He believes that this method of feeding will be of value, too, in surgical conditions of the œsophagus such as fistula, or during the period after operation for diverticulum when the ordinary passing of food through the gullet should not be permitted.—*J. Am. M. Ass.*, May 12, 1928.

A Note on Camptocormia.—Camptocormia is a neurosis occasionally seen in civil life. It was relatively common during the late war, especially among the Latin races, and there is an abundant French and Italian literature. The malady is the assumption of a gait and posture described by Hurst as resembling that of a stage octogenarian. The body is bent forward at the hips; the shoulders are braced backwards; the head is lifted by extension of the cervical spine. The patient peers upwards and forwards, grinning with fatuity. There are concomitant functional course tremors of the head and arms and shaky weakness of the legs, with slight knee flexion. On getting the patient to repose on a flat table, both the dorsilumbar flexion and the cervical extension disappear.—G. F. Walker, *Lancet*, 1928, i, 808.

Association Notes

Preliminary Programme

FIFTY-NINTH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION

CHARLOTTETOWN, JUNE 18, 19, 20, 21, 22, 1928

Monday, June 18th

- 9.00 a.m.—Registration at Prince of Wales College.
- 10.30 a.m.—Meeting of Council. Prince of Wales College.
- 12.30 p.m.—Council Luncheon at Victoria Hotel. Guests of the President-Elect, Dr. S. R. Jenkins. Installation of the President.
- 1.30 p.m.—Luncheon at Beach Grove Inn, and drive about the City and Suburb—for ladies.
- 2.30 p.m.—Meeting of Council.
- 7.00 p.m.—Dinner at Beach Grove Inn. The Council to be guests of the Charlottetown Medical Society.
- 8.30 p.m.—Reception and Musicales at Prince of Wales College.

Tuesday, June 19th

- 10.00 a.m.—Meeting of Council. Prince of Wales College.
- 11.00 a.m.—Drive to Cavendish, where luncheon will be served.
- 12.00 a.m.—Annual meeting of the Canadian Medical Protective Association.
- 12.30 p.m.—Luncheon.
- 2.30 p.m.—Meeting of Council.
- 4.30 p.m.—Tea at Golf Links, guests of Charlottetown Golf Club.
- 7.00 p.m.—Dinner. The Council the guests of the Prince Edward Island Medical Association at the Victoria Hotel.
- 8.30 p.m.—Bridge for the ladies at the Navy League.

Wednesday, June 20th

- Scientific Session. Prince of Wales College.
- 9.00 a.m.—Coarctation of the aorta with obliteration of the descending arch

diagnosed during life in a boy of 14; impending rupture of the aorta; cerebral death; with a statistical study of the causes of death in 200 cases with autopsy. (Lantern.)

Dr. Maude Abbott and Dr. W. F. Hamilton, Montreal.

The Treatment of Pernicious Anæmia.

Dr. Duncan Graham, Toronto.

The Post-operative Accident.

Dr. G. H. Murphy, Halifax.

Heart Disease and Pregnancy.

Dr. W. B. Hendry, Toronto.

Types of Encephalitis Lethargica in New Brunswick.

Dr. A. F. VanWart, Fredericton.

Carcinoma and Ulcer of the Stomach, with Demonstration of Wax Models.

Dr. E. M. Eberts, Montreal.

Pathological Changes in the Breast, and their Clinical Signs.

Sir Lenthal Cheatle, London, Eng.

Luncheon

- 4.00 p.m.—Garden Party at the residence of His Honour the Lieutenant-Governor of the Province of Prince Edward Island.

- 7.45 p.m.—Annual Dinner Dance at Beach Grove Inn.

Thursday, June 21st

- 9.00 a.m.—The Wasted Hand.

Dr. L. J. Austin, Kingston.

Asthma.

Dr. Daniel Nicholson, Winnipeg.

Primary Ulcerative Colitis.

Dr. P. H. T. Thorlakson, Winnipeg.

The Treatment of Chorea.

Dr. Haig Sims, Montreal.

Focal Infection as Encountered in Common Disabilities.

Dr. W. L. Robinson, Toronto.

Benign Papilloma of the Bladder.

Dr. R. E. Powell, Montreal.

Pleural Pains—their cause.

Dr. H. A. Bray, Supt. New York State Sanitarium, Saranac Lake, N. Y.

Maternal Mortality.

Dr. Helen MacMurchy, Ottawa;
Dr. W. B. Hendry, Toronto.

11.00 a.m.—For ladies. Drive about city and suburbs and visit to Fox Ranches.

Luncheon

3.00 p.m.—Drive to Dalvay, the summer residence of the Bishop of Charlottetown, where tea will be served at 4 p.m.

8.00 p.m.—Public Meeting, Prince of Wales College, at which the following addresses will be given:—

Sunlight—its effect on the growth and resistance of the child.

Dr. Alan Brown, Toronto.

The Value of Periodic Health Examinations.

Dr. A. Grant Fleming, Montreal.

Immigration.

The Honourable J. H. King, M.D.,
Minister of Health for Canada.

Friday, June 22nd

9.00 a.m.—The Use of Sulpho-cyanate of Soda in High Blood Pressure.

Dr. R. D. Rudolf, Toronto.

Dr. A. G. Smith, Toronto.

Cancer of the Cervix Uteri; the value of hysterectomy versus radiation in early cancer of the cervix.

Dr. John Fraser, Montreal.

Cancer of the Stomach.

Dr. F. N. G. Starr, Toronto.

Some Clinical Aspects of Hypothyroidism.

Dr. A. H. Gordon, Montreal.

Consideration and Treatment of Chronic Purulent Otitis Media.

Dr. Geo. Tobey, Boston.

Responsibilities and Opportunities of the General Practitioner in Preventive Medicine.

Dr. A. Grant Fleming, Montreal.

Some Common Mistakes in Diagnosis and Therapy in Diseases of Children.

Dr. Alan Brown, Toronto.

Luncheon

4.00 p.m.—Garden Party at the home of Dr. and Mrs. S. R. Jenkins, Charlottetown.

7 00 p.m.—Alumni Dinners and Class Reunions.

NOTES REGARDING THE MEETING

Headquarters.

The Prince of Wales College, in which will be housed the scientific sessions, registration, and scientific and commercial exhibits.

Registration.

The registration office will be found in the Exhibit Hall, Prince of Wales College. As admission to scientific sessions and entertainments will be by convention badge only, members are advised that they must register, as must also, the members of their party.

Messages.

It is suggested that members in attendance have all letters, telegrams and telephone calls directed to them in care of the Canadian Medical Association, Prince of Wales College, Charlottetown, P.E.I.

Programme.

It will be noted that there are to be no Sectional Meetings. All papers will be presented in General Sessions. The Programme Committee announces that the programme will start on time each morning, and will continue until completed before adjournment is made for luncheon. The afternoons are thus left free for entertainment.

The Annual Dinner Dance.

The Annual Dinner Dance will be held on Wednesday night at Beach Grove Inn.

CANADIAN MEDICAL PROTECTIVE ASSOCIATION

All members of the Canadian Medical Protective Association are asked to note that the annual meeting of that Association will be held in Prince of Wales College, Charlottetown, on Tuesday, June 19th, commencing at twelve o'clock noon. As important business will come up for consideration, it is hoped that there will be a large attendance at this meeting.

Men and Books

AN OBSTETRICIAN-ADVENTURER TO
THE HUDSON'S BAY IN 1812—

DR. THOMAS MCKEEVOR,

By D. A. STEWART, M.D.,

Ninette, Man.

In a good ship which got under way about four o'clock in the afternoon of Wednesday, June 24th, in the year 1812, and sailed out of Sligo Bay for the desolate coasts of Hudson's Bay with the most valuable cargo a ship can carry, a colony of people swarming from the old hives of population to a new, empty land, the responsibility for adequate medical care was carried by a young man, Thomas McKeevor, M.D. "A few months' relaxation from professional studies during the summer of the year 1812, and a very liberal offer of the Earl of Selkirk, induced him "to become the medical attendant on his Lordship's colony, then about to depart for Hudson's Bay."

I have used the customary phrase "a good ship," but our author does not explicitly state that it was such; indeed, by a very unusual oversight, he has failed to record the name of either ship or captain. However, it was one of the Hudson's Bay Company's ships and neither the *Eddystone* nor the *King George*, for these are mentioned as fallen in with on the passage out. There remains a choice between the *Prince of Wales* and the *Edward and Ann*. On general principles we decide that our adventurer fared forth on the Hudson's Bay Company's ship *Prince of Wales*, which had already sailed from Stornoway with Selkirk colonists from the Western isles of Scotland, including a dozen young married couples, among whom were Mr. and Mrs. McClain of the Isle of Mull. At Sligo Bay some Irish colonists embarked, including our adventuring obstetrician, and the famous Owen Keveny. Of these interesting details few are told us, our author being chiefly interested in ice, "Esquimeaux," Indians and obstetrics.

From Sligo Bay, then, the *Prince of Wales* sailed on June 24th, arrived opposite York Fort or Factory on August 26th, and by October 27th of the same year, 1812, the passengers, who formed the second party of Selkirk colonists, led by the energetic Mr. Keveny, had reached their new homes in the Red River Settlement, where other troubles awaited them.

Writing in 1819, Dr. McKeevor claims consideration for any defects there may be in the narrative, on account of the "unremitting anxieties" to which he was exposed in his present position of Assistant to the extensive Lying-in

Hospital of Dublin. It is probable, he tells us, that the notes of the journey of seven years before "would never have emerged from obscurity, but for the unprecedented interest which the affairs of that part of the northern world have of late excited." This "unprecedented interest," which made Lord Selkirk's colony a headliner in the old country papers for two or three years, arose from that awkward triangle, the Hudson's Bay Company, the North West Company and the Selkirk Colony, which led by bad management to the most regrettable affair of Seven Oaks and the almost endless recriminations and legal actions that followed. The book, though small, has the long-drawn-out title, or combined title and table of contents common in its day: *A Voyage to Hudson's Bay, During the Summer of 1812, containing a particular account of the icebergs and other phenomena which present themselves in those regions; also, a description of the Esquimeaux and North American Indians: their manners, customs, dress, language, &c., &c., &c., by Thomas McKeevor, M.D., of the Dublin Lying-in Hospital.* Besides the further announcement that the book was printed in London in 1819 the title page has a dash of poetry, for which, in absence of acknowledgement to any other source, we must give credit to the author himself. It is naturally about the peculiar Arctic phases of the voyage:

"Snows swell on snows amazing to the sky
And icy mountains high on mountains piled
Projecting, huge and horrid, o'er the surge."

Yes, it quite likely was his own, but we must remember he was quite young at the time.

After Lord Selkirk and his company have taken their leave, and the departure from his native land, the grand and sublime scenery and the solemnity and stillness of the calm repose of nature sufficiently remarked upon, supper ready in the cabin is announced by the steward, and the voyage has begun.

There is no special interest for us in the ordinary traveller's experiences of the voyage; the ways of ships and sailors and passengers in those days; and seas and fogs and uncertainties generally; the icebergs and fields and the pages of theories about them; the seals and polar bears; the "Esquimeaux," their manners, customs, costumes and vocabulary, and like data about their deadly enemies, the Indians; all of which is promised in the title of the book, and delivered in its pages. But, besides these explicit promises, there are contained in the ample title three separate and distinct "et ceteras," which may perhaps be taken to hint at some more definitely

professional observations and experiences he may share with us. Here is one such "et cetera":—

"On the 24th it blew a tremendous gale of wind; danger considerably aggravated by our having made the land too soon. In a short time the whole horizon was covered with large foaming billows, which

Swell'd and rag'd and foam'd,

To be exalted with the threat'ning clouds.

In a few minutes all was hurry and confusion; the captain flew himself from one part of the deck to the other with the greatest alertness, to assist, by his own exertions, when fear, or hurry, prevented the sailors from doing their duty. In the middle of this awful scene I was called on to render professional assistance to Mrs. McClain, who was seized with labour-pains. It would be difficult to conceive a more unpleasant situation than that in which I was now placed. The dread of being driven on a lee-shore, the howling of the wind among the rigging, the awful sound of the pumps, which we were obliged to keep constantly at work; the cries of my poor patient, who was now suffering the most intense pain which human nature can suffer; all combined with the horribly depressing effects of sea-sickness contributed to render this the most frightful night I had ever witnessed."

We cannot help offering the usual penny for Mr. McClain's thoughts also.

"About twelve o'clock p.m., in consequence of dreadful shouting, I went upon deck, and found every one in the greatest consternation and terror; it appeared we had got in among shoals, and that we had now not more than four-fathom water; in a short time, however, we got into ten-fathom, when we cast two anchors. On these depended all our safety; if they gave way nothing would have saved us from being driven on shore, when we must inevitably have perished; fortunately, however, they held fast. About ten o'clock, a.m., Mrs. McClain was, to the great joy of all on board, safely delivered of a daughter. At twelve o'clock the weather began to clear up, and, with the exception of a few showers, was fine all day."

As no doubt a sympathetic obstetrician ought to be, our author was a champion of the ladies. Speaking of the Indians, "The females, or squaws, as they are generally called, for the most part have an expression of mildness and sweetness in their looks." "The care of the tents is consigned entirely to the woman: as is, indeed, all the drudgery of an Indian life. . . . Notwithstanding all this, they are generally found humble and faithful servants, tender and affectionate wives, fond and indulgent parents."

Of the science and art of obstetrics, as practised ordinarily in the Hudson's Bay territory at that day, he tells at some length in another "et cetera."

"The speed and facility with which the Indian women pass through the most interesting period of female suffering has long been a matter of observation, and surprise. A very remarkable instance of this occurred during my stay at York Fort, which I shall here take the liberty to mention. Mrs. B., an Indian lady, wife of one of the inland governors, was occupied the entire day about her tent. I entered her tent at three o'clock in the afternoon; she was then preparing dinner, which consisted of boiled venison, venison-soup, and English biscuit; she was at that time quite cheerful,

and in remarkably good spirits. About six o'clock in the evening she was seized with labour-pains, when she retired to an apartment in the governor's house, in company with an elderly Indian woman; about half past six she was delivered of a fine boy; and a little after seven of the same evening I saw her walking about the factory. The young infant immediately born was washed with cold-water, and afterwards wrapped up in a young beaver-skin and placed in its cradle. . . . Shortly after the child was born it was given the breast; I could not help admiring the tender and affectionate looks this fond mother gave her little babe while she was giving it this nourishment, or, as they very beautifully express it, the sap of the human breast. The day following that of which I have been speaking, Mrs. B. and her husband set out on a journey of two hundred miles.

"Long, in his account of the North American Indians, relates the following anecdote: 'About an hour before sun-set, on the fourth day, we stopped at a small creek, which was too deep to be forded, and whilst the Indian was assisting me to make a raft to cross over, rather than swim through in such cold weather against a strong current, I looked round and missed his wife; I was rather displeased, as the sun was near setting, and I was anxious to gain the opposite shore to encamp before dark. I asked the Indian where his wife was gone; he smiled, and told me, he supposed into the woods to set a collar for a partridge. In about an hour she returned with a new-born infant in her arms, and coming up to me said in Chippeway, 'Here Englishman is a young warrior.' Mr. Hearne informs us that when a northern Indian woman is taken in labour, a small tent is erected for her, at such a distance from the other tents that her cries cannot easily be heard, and the other women and young girls are her constant attendants. No male, except children in arms, are ever allowed to approach her. It is a circumstance, perhaps, to be lamented, that these people never attempt to assist each other on these occasions, even in the most critical cases. This is in some measure owing to delicacy, but more probably to an opinion they entertain, that nature is abundantly sufficient to perform every thing required without any external helps whatever. Mr. Hearne tells us that when he informed them of the assistance which European women derive from the skill and attention of practitioners in midwifery, they treated it with the utmost contempt, ironically observing, 'that the many hump-backs, bandy-legs, and other deformities, so frequent among the English, were undoubtedly owing to the great skill of the persons who assisted in bringing them into the world, and to the extraordinary care of the nurses afterwards.'"

As a footnote our author adds:—

"We are not, however, to suppose that this process is so readily accomplished in all cases. Mr. Fidler informed me that they are sometimes a day and a night in labour. In this case they frequently pass a stick horizontally along the abdomen, for the purpose of exciting uterine contraction. If travelling after the baby is born they place the child on their backs and resume their journey."

On related topics he has also something to say:

"After childbirth an Indian woman is reckoned unclean for a month or five weeks, during which time she always remains in a small tent placed at a little distance from the others; with only a female acquaintance or two; and during the whole time the father never sees the child. The reason which they assign for this practice is that children when first born are sometimes not very sightly, having in general large heads and but little hair, and are, moreover, often discoloured by the force of labour; so that were the father to see them to

such great disadvantage he might, probably, take a dislike to them, which never afterwards could be removed. It is said that, when delivered of twins, they sacrifice that which appears to them the weaker of the two; this monstrous practice exists among many wandering nations, where the men never take any burdens that might encumber them in the chase. They generally suckle their children for two years; some, however, continue it for three, four and even five years. The absolute want of all kind of domestic cattle, and consequently the total want of all milk-diet, is the principal reason why the American women keep their infants so long a time at the breast. It is probably owing to this long-continued nursing that the mamme are in them so relaxed and pendulous. They are, however, by no means so long as some writers would lead us to suppose; indeed, I suspect there is much exaggeration, if not absolute falsehood, in some of these narrations."

On the crest of this interesting topic our adventurer drifts away from the "Esquimeaux" and Indians, remarks in passing upon his Irish countrywomen, and finally wanders to the far off Hottentots, whither we need not follow him.

Dr. McKeever returned home by the same ship, though he tells us nothing of a return journey, and did not become a colonist. We could well have spared many pages about ice packs if he had only given us more about that mixed Scoto-Irish second group of Selkirk colonists and their doings, about the mutiny, and the whacking of heads that bobbed up through the forward hatch, and about Mr. Owen Keveny's original invention of punishment by running the gauntlet. Of these and many other things he says nothing. Had he only come on to "The Forks" (Red and Assiniboine) with the colonists he would have had no easy or peaceful life, but might he not have been, with Dr. Edwards, the surgeon Holdsworth, and others, a charter member of the Manitoba Medical Association? He decided otherwise, however, and after a brief holiday among bergs and ice floes, "Esquimeaux" and Indians, returned to the "unremitting anxieties" of obstetrical practice, and to the labours awaiting him at the Lying-in Hospital of Dublin.

ANNIVERSARIES AND COMMEMORATIONS*

By H. E. MACDERMOT, M.D.,

Montreal

To those who seek out anniversaries and commemorations of famous dates in medical history, 1927 and 1928 yield a rich harvest. There are not many years in the century which are observed in commemoration of such men as Robert Boyle, of John Hunter and Lord Lister; or of the publication of such works as "De Motu

Cordis" and John Bright's observations on nephritis.

These are names and events which evoke that comment and reflection of which only the greatest may be repeatedly the subject without diminution of their freshness and inspiration for us; but it is not my purpose to deal with them particularly. I am interested for the moment more in recalling others whose names, if they are not "an echo and a light unto eternity," at least are as tapers which "yet burn through the night of time."

Our list begins well with the name of *Nicolaus Leoniceus* (1428-1524), physician and professor of medicine in Italy, whose independence and intellectual courage was well shown in his daring to correct the botanical errors in Pliny's Natural History. His studies of syphilis, a disease which he regarded as infectious, should also be recalled.

Anutius Foesius (1528-1591) published an edition of Hippocrates, which was one of the most valuable produced before the all-embracing ten-volume edition on which Littré spent his life in the middle of the last century.

The year 1728 saw the death of the last of the famous Huguenot family of *Chamberlens*. For three generations they had lived and practised surgery and midwifery in England, their devotion to the latter branch being especially strong; most of them attended the queens of the time. This specialization was no doubt dependent to some extent on their knowledge of the use of obstetrical forceps, which there is good reason to believe was original with them. They kept this knowledge as a family secret for nearly two hundred years.

Marcello Malpighi (1628-1694) has left his name enshrined in anatomy, but it would be an indictment of our historical sense to associate his name with anatomy alone, in the unfortunately narrow sense in which the term is now employed. He was an embryologist, a physiologist, and a histologist. He was born in the year in which Harvey published his "De Motu Cordis," and was destined to show by means of the microscope the capillaries which Harvey had foreshadowed, but had not been able to actually see. As has been well said by Dr. Fraser Harris, "Harvey made their existence a logical necessity; Malpighi made it a histological certainty." Malpighi's description of the red blood corpuscles (discovered by Swammerdam) as "fat globules looking like a rosary of red coral," recalls Oliver Wendell Holmes' quality of imagination, and is an indication of his unusually sensitive and attractive personality.

Oliver Goldsmith was born in 1728. He will not be remembered for his contributions to medical knowledge; indeed, his association with professional work is notable for its obscurity.

* Reprinted, with slight alterations, from the *Bulletin of the Medical Library Association*, April, 1928.

Scientific accuracy he never possessed, witness the story in his "History of Animated Nature" of a famous mathematician of the time being so much given to yawning that he was unable to complete his lectures; of which statement a categorical denial was made by the indignant family of the professor, and a charge of calumny made against Goldsmith. But we can very well afford to exchange his medical qualifications for what he gave to English literature.

John Hunter was born in 1728 and died in 1793. How one would like to have again the delight of reading for the first time of his gigantic labours. There are few men in medical history with whom the medical student should so soon become acquainted.

Simon André Tissot (1728-1797), physician of Lausanne, shows us that as long ago as 200 years books on medicine could be written in popular style. His tract "Avis au peuple sur la santé" ran through ten editions in six years, and was translated into every European language.

Charles White (1728-1813) is remembered for his pioneer work in midwifery, but he was also the first to excise the head of the humerus, and

introduced the method of reducing shoulder dislocations by the leverage of the heel in the axilla.

Richard Neale (1827-1900) conducted a busy London practice and managed at the same time to be the editor of *The Medical Digest*, a forerunner of our *Index Medicus*.

Lord Lister (1827-1900). His centenary year has seen large additions to the already extensive literature which has grown up around his name and work.

Albrecht von Graefe (1828-1870). Few men have contributed so much to a specialty as did he, and in as short a period. He is characterized by Dr. Garrison as "creator of the modern surgery of the eye, and indeed the greatest of all eye surgeons."

Etienne Tarnier (1828-1897), was responsible for developments in obstetrical practice. There can be no fifth year student to whom the mention of his name does not at once recall the axis-traction forceps.

There are two medical journals also whose centenary year has just been completed, the *Edinburgh Medical* and the *Boston Medical & Surgical* (now *The New England Journal of Medicine*).

Medico-Legal

The following is a sequel of some interest: "Members of the medical profession will certainly endorse the *obiter dictum* of Lord Justice Scrutton that a jury is rarely a suitable tribunal to try a case which involves a right differentiation between what is an error of judgment—which is not actionable—and what is, in fact, a departure from the degree of skill which a professional man holds himself out to exercise—which constitutes negligence in the eyes of the law. Even so, it must be poor consolation to Dr. Arnold Alcock of Gloucester to know that, although the Court of Appeal, consisting of Lords Justice Scrutton and Sankey and Mr. Justice Romer, might have come to a different conclusion from that of a special jury at Bristol Autumn Assizes, yet the sacrosanct nature of a jury's findings of fact prevented the Court of Appeal from interfering with their verdict.

A report of the case as it was presented at the assizes appeared in *British Medical Journal*, December 10, 1927, page 1121. Briefly, a child named Phyllis Tyndall, aged 10, who was described as 'a prodigy at the piano,' fractured her left humerus as the result of a fall from a pony. Dr. Alcock claimed to have skilfully adopted the most approved scientific method in reducing the fracture, since during the operation he caused an x-ray photograph to be thrown upon the screen, and when he had finished his task the radiologist reported that the bones appeared to be in perfect alignment. Unfortunately, however, the child's arm became fixed at

the elbow and Volkmann's contracture developed, resulting in impairment of movement. The trial jury found that Dr. Alcock had been negligent, and proceeded to apportion £2,000 damages to the child and £150 to the mother.

The comments of the three members of the Court of Appeal upon this verdict are interesting. While Lord Justice Sankey agreed with Lord Justice Scrutton that questions of professional negligence were difficult, he thought an ordinary jury was more likely to come to a correct conclusion than a jury of experts; Mr. Justice Romer ironically observed, however, that Dr. Alcock must get such consolation as he could out of the fact that trial by jury was the foundation of his liberties!

Questions of fact are the peculiar province of a jury, and it is an axiom firmly established in our law that a jury's verdict cannot be set aside unless it can be said that there was no evidence upon which they could have found their verdict. As Lord Justice Scrutton tersely observed, the jury were the persons put there by the Constitution to try actions involving questions of negligence, and, since there was evidence before them on which they were entitled to decide either way, it was impossible for a Court of Appeal to interfere with the result, although such a court might have come to a different conclusion. The verdict of the constitutional tribunal was, therefore, allowed to stand, and Dr. Alcock's appeal was dismissed."—*Brit. M. J.*, March 24, 1928, i, 528.

Medical Legislation

NEW MEDICAL LEGISLATION IN ALBERTA

In reference to the Act relating to the discipline of the professions, quoted in our June issue, p. 612, the following will be interesting: The Calgary Daily Herald of March 12, 1928, contained an item in which it is stated that the Calgary Board of Trade, acting through its legislative committee, sent a telegram to Premier Brownlee of Alberta protesting against the proposed piece of legislature entitled "The Professional Discipline Act." The telegram reads as follows:—

"Calgary Board of Trade protest against enactment proposed bill, number 31, the Professional Discipline Act, on following grounds:

That it allows board to determine what is or what is not unprofessional conduct; to set aside findings of the governing body of any profession; to hear and determine all questions of law; to investigate and decide complaints governed only by rules adopted by the board and not by the rules of legal evidence, and, most important of all, that there shall be no appeal from the decision of the board nor shall the same be questioned in any court of law. This board feel that to pass this bill in present form would be to deprive the learned professions of the ordinary rights of British subjects, rights to which all other citizens are entitled. Forwarding copy of full report on this proposed bill adopted by the board."

Clinical and Laboratory Notes

AN AID IN THE DIAGNOSIS OF CANCER

The following method is proposed as an aid in the diagnosis of cancer.

"A 2 per cent solution of magnesium sulphate is poured into ten reaction glasses, in amounts increasing from 1 to 10 drops. One c.c. of blood is put into each glass, after removal from a vein by means of a Record syringe. This mixture is shaken and allowed to stand for two hours. The glasses are then examined to determine which amount of the solution has been able to prevent the coagulation of 1 c.c. of blood. Normally 3 to 5 drops are sufficient, and this amount is nearly constant for each person, under varying conditions of temperature, diet, etc.

Of eighteen cases, examined by this method,

and later proved by operation to be cancer patients, sixteen, or 88 per cent, showed an increase in coagulation valence to from 7 to 11 drops of the solution. Of twelve cases of ulcer ventriculi, all showed a decrease to from 1 to 3 drops. This appears to be pathognomonic.

In forty cases of various diseases, such as neurosis, tuberculosis without fever, nephritis, gall bladder affections, diabetes, thirty-five cases showed a normalcy of from 3 to 6 drops. Three cases of icterus showed a decrease of from 1 to 3 drops. Two others (diabetes and cholecystitis) produced an increase to 7 drops. A second examination lowered the second case to 5 drops." H. Boch, and G. Rausche, *Zentrabl. f. Chir.*, 1926, liii, 1440. Abs. in *J. of Lab. and Clin. Med.*, 1928, xiii, 698.

Epidural Caudal Anaesthesia in Prostatic Surgery.—Hugh H. Young, Baltimore, believes that epidural sacral anaesthesia with 3 per cent procaine hydrochloride is the anaesthetic of choice in prostatic and other perineal surgery. It is particularly valuable in the very aged, in cases of high blood pressure, and in the presence of cardiac lesions, renal impairment and respiratory infections. The relaxation obtained and the freedom from hæmorrhage is much better than with a general anaesthetic, and the ability of the patient to drink water in abundance immediately after the operation is a distinct ad-

vantage. The few failures are not a contra-indication.—*J. Am. M. Ass.*, March 3, 1928.

C. J. Bond has used irradiated ergosterol, in the form of "radiostol" in oil, diluted with liquid paraffin, on gauze, as a dressing for wounds. He believes, from observed cases, that this plan not only reduces infection and promotes healthy granulations, but also stimulates the ingrowth of epithelial cells from the margin, and so favours the healing process.—*Brit. M. J.*, 1928, i, 339.

Correspondence

Our Edinburgh Letter*(From our own correspondent)*

Post-Graduate Courses.—For the purpose of organizing post-graduate teaching in Edinburgh, the medical schools of the university and the Royal Colleges elect a joint committee. The official courses held under the auspices of this committee are largely attended, and number among their members graduates from all parts of the world and of all medical schools. The courses are altered and moulded from year to year on suggestions of the graduates attending, and in this way are kept abreast of current progress and in touch with the requirements of the graduates. The classes are mainly held during the summer vacation, and are designed to meet as far as possible all requirements, though should it be necessary instruction can be arranged to meet individual cases. For the general practitioner a course of one month (a single fortnight of which may be taken) is given, commencing on August 13, 1928. One hour each day is allotted to Medicine, to Surgery, and to one of the special subjects, the remainder of the day being occupied by subjects such as Diseases of Children, Venereal Diseases, Gynæcology, Insulin and Heliotherapy, Tuberculosis, Bacteriology, and other subjects of practical value to the practitioner. For the surgeon a special surgical course of one month's duration commences on the same date. For the obstetrician and gynaecologist a full day course of one month's duration commences on July 16th. In addition to these, courses are held throughout the year on Venereal Diseases; Ear, Nose and Throat; Ophthalmoscopy; Surgical Pathology, etc.

During each academic term clinical lecture demonstrations, confined to post-graduates, are given daily by the surgical staff of the Royal Infirmary. These latter are a comparatively recent innovation and call for special comment. Owing to the presence of an increasing number of graduate visitors at the surgical clinics of the Royal Infirmary, one of the surgeons on the honorary staff, Mr. Henry Wade, thought it advisable to set aside definite times for teaching confined to graduates during the university sessions. In 1923, Mr. Wade and Mr. J. J. M. Shaw commenced their Saturday morning post-graduate clinics. At these, lecture demonstrations on clinical cases were given, and operations on cases of unusual interest were performed. By such means under-graduate teaching was not interfered with, and the graduate was given an opportunity of following the surgical methods practised. In the following year the success of these meetings

attracted the attention of the Edinburgh Post-Graduate Committee, and a complete course in Clinical Surgery at the Royal Infirmary was drawn up. This course occupies a period of six weeks during each of the three university terms, commencing in November, February and May. Meetings are held on six days in the week at 11 a.m., in the theatres attached to the wards of the surgical staff of the hospital, and a different clinic is thus visited daily.

A handbook giving full particulars may be obtained from the Secretary, Post-Graduate Courses in Medicine, The Dean's Office, University New Buildings, Edinburgh.

Honorary Degrees.—The Honorary Degree of Doctor of Laws of Edinburgh University will be conferred upon the following distinguished people: Sir John Rose Bradford, K.C.M.G., President of the Royal College of Physicians of London; Dr. James Cossar Ewart, F.R.S., formerly Professor of Natural History, Edinburgh University; Dr. George Lovell Gulland, formerly Professor of Medicine, Edinburgh University; Dr. James Haig Ferguson, M.D., formerly Senior Lecturer in Midwifery and Gynæcology, Edinburgh University; Dr. Robert Alexander Fleming, P.R.C.P. Ed., formerly Senior Lecturer in Clinical Medicine, Edinburgh University; Mary Scharlieb, D.B.E., M.D.; Dr. F. G. Donnan, F.R.S., Professor of Chemistry in the University College, London; and Mr. Henry S. Wellcome, founder of the Research Laboratories at Gordon College, Khartum.

Tuberculosis.—The Annual Report of the Royal Victoria Hospital Tuberculosis Trust has recently been issued. This deals with the work of the Trust in the treatment and prevention of tuberculosis throughout Scotland, and also with the Sanatorium Colony at Southfield, near Edinburgh, for 1926-7. A hopeful aspect of the anti-tuberculosis campaign is to be found in the notable increase in the number of applications for the admission of young children to the colony. It has now become a matter of general acceptance that tuberculosis is for the most part implanted in childhood, and the report points out that "it is to the nursery and school-room that observation and effort should be directed, if measures for the eradication of tuberculosis are to be fundamentally sound and practically effective." It is on account of this that the request for admission of children to the Sanatorium Colony at Southfield has been favourably entertained. It is certain that the earlier the fact of infection is known the lighter its results can be made. The production of clean milk is a link in the chain of the anti-tuberculosis effort and the Tuberculosis Trust

has developed a herd of one hundred tubercle-free cattle during the last few years. In connection with the new report, Sir Robert Philip, to whose enterprise the scheme owes its inception, has pointed out that "Had the death rate from tuberculosis which prevailed fifty years ago prevailed in 1925, they should have expected 13,258 deaths from pulmonary tuberculosis; in actual fact they had only 3,734. That meant a saving of 9,524 lives, or a reduction during the period of 71.8 per cent. These facts are strikingly supported by Dr. James Crocket, the Glasgow University Lecturer on Tuberculosis. In a recent address he pointed out that it was likely to prove that tuberculosis, so far as Scotland was concerned, was a disappearing disease. The death rate had fallen 43 per cent in fifteen years. The death rate in Scotland was 99 per 100,000 in 1926. In Paris, for the same year it was 301; in Budapest, 287; in Madrid 293; in Venice 210; in Manila 541; in Sofia 577; and in 30 Swiss cities, 137. In fact the death rate from tuberculosis in Scotland has fallen so unusually low that it was somewhat difficult now to find a country where it was lower. Few countries were really healthier than our own, though other climates might be pleasanter. "Our legislators should go on with their schemes of amelioration, of providing better conditions of life, better houses, better conditions of work, and better food production. These would prove investments giving capital appreciation and interest beyond the dreams of avarice. They would certainly do much to reduce and eventually eradicate this great white scourge which John Bunyan aptly describes as the Captain of the Men of Death."

Royal Appointments.—The King has been pleased to make the following appointments in his Majesty's medical household in Scotland: John Fraser, M.C., M.D., F.R.C.S., to be Honorary Surgeon; Arthur Havens Sinclair, M.D., F.R.C.S., to be Honorary Oculist. Professor Fraser is Regius Professor of Clinical Surgery in the University of Edinburgh, and Surgeon to the Royal Infirmary. Dr. Arthur H. Sinclair is Ophthalmic Surgeon to the Royal Infirmary, and to the Royal Hospital for Children, and Lecturer on Diseases of the Eye in Edinburgh University. In addition, Ashley W. Macintosh, M.D., and John Marnoch, C.V.O., of Aberdeen, have been appointed Honorary Physician and Honorary Surgeon.

The "Old Trojan."—The following epitaph is engraved upon a tombstone in the churchyard at Rodel, South Harris, Outer Hebrides. The "deceased" was known during life, possibly not without reason, as the "Old Trojan."

"To the Memory of

Donald Macleod of Berneray, son of John Tutor of Macleod, who in vigour of body and

mind and firm adherence to the principles of his ancestors resembled the men of former time. His grandfather and his granduncle were knighted by King Charles II for their loyalty and distinguished valour in the Battle of Worcester. When the Standard of the House of Stewart, to which he was attached was displayed A.D., 1745, though past the prime of life he took arms, had a share in the actions of that period, and in the Battle of Falkirk, vanquished a dragoon hand to hand. From that time he lived at his house of Berneray, universally beloved and respected. In his 75th year he married his third wife, by whom he had 9 children and died in his 90th year the 16 Dec. 1783. This Monument was erected by his son Alexander Macleod of Herris, Esq."

GEORGE GIBSON

Our London Letter

(From our own correspondent)

Doctors and the Budget.—The Chancellor of the Exchequer produced his Budget statement towards the end of last month, and it is of interest to consider how the average medical practitioner will fare under the new taxes and reliefs. Chief in importance, if the agitation against it is any test, is the re-introduction of a tax on various oils, including petrol, of fourpence a gallon. It is proposed to exempt from duty oil used in the fishing fleets and in agricultural tractors, for example, and it might well be urged that a similar privilege should be extended to the petrol of the medical practitioner's car used for professional purposes, for its owner should scarcely be called upon to bear the burden of increased running costs. On the other hand, the increase in the reliefs given to the income-tax payer in respect of children may benefit the medical practitioner in two ways. The raising of the allowance for the first child from £36 to £60, and for other children from £27 to £50, will make a definite difference in the tax paid by the average practitioner with children of his own, and it may also be that such a relief to the general population will increase the birth-rate, which may in time mean more work for the family doctor! The exhaustive scheme for rating reform may also have its effect on the medical profession, and the Minister of Health's promised Local Government Bill, to be introduced in November, will be awaited with interest. Local authorities pay out large sums each year for reasons of public health, and it may be that the promised changes will make some difference to the medical officers concerned.

Cod-Liver Oil and the Law.—A recent case before the Salford stipendary magistrate has attracted a certain amount of attention. A well-known firm of chemists was fined £30 for the sale of cod-liver oil tablets "not in conformity

with the Food and Drugs Act". The basis of the prosecution was that the samples obtained for analysis were lacking in vitamins A and D, and, in support of this, various laboratory experiments, chemical and biological, were quoted by expert witnesses. But the *British Pharmacopæia* contains no official tests for cod-liver oil, and the prosecution had to base its evidence on the colour test for vitamin A, included in the *United States Pharmacopæia*, and the "generally accepted" view that cod-liver oil is able to prevent rickets. It was shown that the tablets in question failed in both these tests and the magistrate imposed the fine as stated above. More may be heard of this, for leave to appeal was granted. The interest lies not so much in the result of this particular case, nor in the facts brought out in evidence, but in the alarming possibility that in future debatable questions in therapeutics may be settled by magistrates and judges, when experts from both sides bring forward conflicting evidence. Suppose the defence in this case had denied that rickets was caused by vitamin deficiency, they could have obtained many authorities, especially from France, to support this. In the case of substances other than cod-liver oil the affair might become very complicated. A great deal of feeling has recently arisen in this country as a result of certain cases of accident or negligence where the jury has acted as a group of medical assessors. If the sifting of pharmaceutical evidence is added to the manifold duties of the English judicial system there will be a lot more to be said.

Hop-pickers' Camps.—The hop-picking season is not yet upon us, but each year the scandal of the sanitation in certain districts forms the subject of increasing agitation, and the Royal Sanitary Institute, at a recent meeting at Maidstone in Kent, the hop-county, took the opportunity of discussing the matter. Between 70,000 and 100,000 persons, mainly women and children, from some of the poorest districts in London, trek each year into Kent during the picking season, and the resulting over-crowding in the huts and the want of adequate latrine accommodation leave much to be desired. The hop-growers are required to provide satisfactory premises, and there is encouraging evidence of a minority who are really concerned with the welfare of the pickers. By-laws exist, but their administration by the many local authorities concerned is no easy matter, and it is suggested that a joint controlling committee of the Ministry of Health, acting with the local authorities, should take charge. The Ministry is alive to the state of affairs, for a special investigation was instituted in 1925. It is also suggested that the education of hop-pickers by the health authorities in the districts in London from which they mostly come should be carried out in matters of camp-hygiene and sanitation. Private effort has supplied a hospital in the heart of the district, and a medical centre has proved of great service. The meeting at Maidstone may stimulate public authorities to take more active measures.

ALAN MONCRIEFF

London, May, 1928.

Reports of Societies

ROYAL SOCIETY OF MEDICINE

Present Position of Radium Therapy

"At a meeting of the Section of Electrotherapeutics of the Royal Society of Medicine on March 16th, Sir Henry Gauvain presiding, a discussion took place on the present position of radium therapy.

Mr. Hayward Pinch, director of the Radium Institute, in an opening address, reminded the Section that it was now thirty-two years since Henri Becquerel read his paper on an invisible radiation emitted by salts of uranium, and thirty years since the investigations by the Curies began. Radium at first had purely non-medical applications, but after a time it began to be used by French medical men in the treatment of superficial lesions, a surface reaction being obtained which varied in degree from a mild erythema to a definite ulceration. The next stage was the use of radium salts enclosed in tubes and inserted into easily accessible

tumours; the results were encouraging, and presently the help of the surgeon was solicited and an elaborate system of surgery of access was practised. The latest development of all, and an extremely important one, was the use of "seeds" of screened radium emanation or "radon." Several years ago the use of un-screened emanation seeds was tried, but they were found to have an intense necrotic action and to cause pain, and therefore were given up. Screening did away with these disadvantages, and the results were really surprising. The proportions of alpha, beta, and gamma rays in a specimen of radium might be set out as 10,000, 1,000, and 100 respectively, and the alpha rays could be disregarded therapeutically. Of the beta radiation, 94 per cent was absorbed by 1 cm. of body tissue, so that these rays were most effective when applied in superficial therapy. Complete absorption of the gamma rays by the body never occurred.

Deep radium therapy he defined as the treat-

ment of disease by prolonged exposures with radium or "radon" apparatus so screened as to emit a preponderant hard beta and gamma or gamma radiation only. The best standard screen for getting the gamma radiation only was 1 mm. of platinum, which cut out all beta radiation, and transmitted 90 per cent of gamma. But platinum was an expensive metal, especially when used for large surface applicators, and an equivalent filtration was provided by 2 mm. of lead, lead being of approximately half the density of platinum. Deep radium therapy might be carried out by three methods: (1) externally, by tubes or other applicators, either in contact or at a distance; (2) by employing surgery of access so as to apply the radium to the growth from a more advantageous position; (3) by embedding screened emanation seeds, using a technique which he described and illustrated. At the Radium Institute contact radiation was chiefly used—in the treatment of breast cases, for example, 3 mg. of radium element, with a filter of 2 mm. of lead, in actual contact was a medium dose. The disadvantage of the inverse square law, whereby the radiation diminished with depth, was countered as far as possible by the cross-fire method. Very little distance radiation was carried out at the Radium Institute, though it was largely used on the Continent. The speaker illustrated the enormous difference which a separation of 10 cm. between the skin and the applicator made in the radiation reaching the tumour. There was, however, one form of distance radiation which had been very useful—that was the placing of radium tubes containing 50 to 75 mg. in a mould of wax compound for the treatment of glands of the neck.

There were extreme schools among radiologists, some of whom believed in the use of large doses for a short time, and others the use of small doses for a long time. The pendulum had swung over from the former to the latter, and there were many who advocated small doses given for a great length of time, as though that were the only method of any value. Mr. Pinch denied this, believing that there were many cases in which excellent results could be obtained with a large quantity of radium used for a short time. Lymphosarcoma and other conditions responded best to this method, while, on the other hand, slow-growing squamous-celled epitheliomas responded best to small quantities applied for a long time. Between these extremes there must be many conditions where the optimum would be some more equal distribution of the two factors, quantity and time.

Treatment by burying screened emanation seeds had several distinct advantages. It involved very little traumatism, and usually necessitated only local anaesthesia; as the seeds were charged only with emanation it was no great

matter if they were lost; and the container, being made of platinum, did not corrode. Mr. Pinch showed photographs of a number of cases of improvement resulting from radium in deep-seated conditions. One case was in an octogenarian who had an epithelioma of the ear, the size of a lemon. Thirteen seeds were buried, and within four weeks the whole growth had disappeared. Another case was that of a woman who came in the most miserable condition with an epithelioma affecting the faucial pillars and the epiglottis, and running a little way out of the pharyngeal wall. Here tubes were buried, and the effect after six weeks could only be described as miraculous. In a rapidly growing epithelioma of the anal canal, so painful that examination without an anaesthetic was impossible, thirteen seeds were inserted, and six weeks later the rectum could be examined with perfect ease, and there was not a sign of growth remaining.

Mr. Pinch concluded with a word of protest and of prophecy. His prophecy, which he made deliberately, after the fullest consideration, was that in the very near future radium would form as necessary a part of the up-to-date surgeon's armamentarium as the scalpel, and it would be possible by this means to handle with confidence and success many cases of malignant disease which at present were regarded as inoperable and hopeless."—*Brit. M. J.*, 1928, i, 496.

THE HALIFAX MEDICAL SOCIETY

Following the very interesting final meeting on the 1927-1928 programme, the annual meeting of this Branch of the Medical Society of Nova Scotia was held at the Country Club, Ashburn, on Thursday evening, April 19, 1928, Dr. G. H. Murphy, the President, in the chair. Forty members were present at the meeting, which began with a very pleasant banquet, where the menu was excellent and the service good in every particular.

Following the banquet, the meeting approved of the minutes of the last annual meeting and the last regular meeting, next dealing with regular business.

The Executive presented a report approving of a new Constitution and By-Laws for the Society, which was, on motion, subsequently adopted. The Committee on the Founders of Dalhousie Medical College reported as follows:

"That enquiry showed that the school was founded in 1867 as the Medical Faculty of Dalhousie University:—

That they had accepted as the official members of the first faculty: W. J. Almon, M.D., President; A. P. Reid, M.D., Dean; G. Lawson, Ph.D., LL.D.; J. D. Ross, M.D.; E. D. Farrell, M.D.; T. R. Almon, M.D.; A. H. Wood-

hill, M.D.; A. G. Hattie; Rev. James Ross, Principal, *Ex officio* :—

That a tablet of bronze be suitably placed to commemorate this event :—

That the cost, \$120.00, should be met as determined by the Society."

This report was adopted and the cost of the enterprise ordered to be charged against the regular funds of the Society.

The report of the Secretary-Treasurer showed a substantial balance on hand, and the paid-up membership of the Society to be 92.

The proposed tuberculosis programme of the Nova Scotia Commission was then considered, the subject being based on the resolutions passed by the medical members and the advisory medical members of the Commission. The Society very greatly appreciated the manner in which Dr. K. A. McKenzie and Dr. Chisholm presented the subject, but the meeting felt that action should not be taken hurriedly. It was therefore resolved that the matter be referred to the Executive Committee for report at the next regular meeting.

The Society made a very acceptable move when Dr. Cunningham moved, seconded by Dr. A. McD. Morton, that Mr. W. W. Kenny, for nearly thirty years the Superintendent of the Victoria General Hospital, be made an

Honorary Member of the Halifax Medical Society. The election was unanimous.

By letter, Dr. L. R. Morse, President of the Medical Society of Nova Scotia, called to the attention of the meeting that the next meeting of the Provincial Society would be its 75th anniversary, and the Provincial Executive had suggested it be held in Halifax. While entirely approving of the suggestion, the matter was left in the hands of the new executive for such action as they might deem advisable.

As noted elsewhere, the Society instructed the Secretary to express to Dr. Hattie their sympathy with him in his present indisposition.

After a very brief valedictory, Dr. G. H. Murphy presented the President-Elect Dr. S. R. Johnston and installed him into his office. After a few appropriate remarks, Dr. Johnston declared the meeting adjourned, *sine die*.

The officers elected for the ensuing year were as follows: President, Dr. S. R. Johnston; Vice-President, Dr. J. R. Corston; Secretary-Treasurer, Dr. H. N. Gosse.

Representatives to the Executive of the Medical Society of Nova Scotia: Drs. Murphy, Johnston, Cunningham, P. A. McDonald and McIntosh. Representative to the V.O.N.: Dr. C. A. Morton.

S. L. WALKER

Topics of Current Interest

COMMERCE IN RADIUM

"The history of the commerce in radium is that of successive attempts made by one country after another to secure a monopoly. The original observation of the Curies, reported to the Académie des Sciences on April 12, 1898, was that two minerals, pitchblende and chalcite, were more radio-active than could be accounted for by the uranium they contained. They suggested that this was probably due to the presence of some element much more active than uranium. A deposit of pitchblende at Joachimsthal in Bohemia was then being worked to supply a small commercial demand for uranium. Using a ton of the Joachimsthal residues the Curies succeeded, with the assistance of Debierne, in isolating a mixture of radio-active substances associated with barium. By progressive separation from the barium they obtained enough of the active substance to enable its character to be determined by the spectroscope, and in 1902 they produced radium chloride in a pure state

The mine at Joachimsthal belonged to the Austrian Government, which sought to establish a monopoly, and founded an institute in

Vienna to investigate the purposes to which radium could be applied. But these discoveries of radium directed attention to geological strata in other countries which were known to contain uranium, such as the beds of autunite in Portugal, and of pitchblende in Cornwall and Saxony. Further deposits of pitchblende were found in the United States, in Mexico, and in India, but the most important discovery was that of very extensive deposits of carnotite in Colorado and Utah. Though this mineral contains a very small proportion of radium (about 1 gram in 400 tons) it proved profitable to work it owing to the ease with which the radium could be extracted.

At the beginning of 1914 the American Government took steps to obtain a monopoly of radium, and decreed that, while radium-bearing mines already discovered should remain the property of the concessionaires, any further discoveries would become the property of the United States. Prospectors would be able to exploit them, but on terms fixed by the Government.

The American monopoly lasted until the Belgian society, the Mining Union of High

Katanga, which was working some copper concessions in the Belgian Congo, brought to light some very rich lodes of pitchblende. The existence of uraniferous lodes was confirmed in 1921 by Professor Schoep of Ghent; by the end of the year the first cargo of mineral reached Antwerp, and by July, 1922, the factory at Oolen was in working order. From that time the monopoly has passed into the hands of Belgium, and the American and other factories are now in a state of partially suspended animation, unable to compete with the Belgians, who at present supply most of the world's demand.

The radium salt chiefly in request at present is the sulphate, which is found most suitable for the preparation of radium applicators. The chloride and bromide, which are easily soluble, can also be obtained, and are considered to be preferable when radium emanation is required. Radium is now generally sold in terms of radium element, and the price of either salt is calculated on that basis. According to a table given by Professor Matignon in a recent article, the price rose from £2 to £5 a milligram in 1904, to twice that amount at the end of 1905, and to £12 in 1906. By 1910 the price had risen to £27, it went to £30 in 1912, and £36 in 1914. This seems to have been the highest point ever touched. The rise occurred in spite of competition, and seems to have been greatest at the time when the French were engaged in extracting radium from the carnotite imported from Colorado. With the establishment of factories in the United States the price began to fall, and was becoming stabilized at about £22 a milligram in 1922, when the Belgian production caused a further fall to £14 in 1923, and the price is now £11 10s.

With the exception of chalk and the quartz sands, which are almost without any trace, nearly all rocks of the earth's crust contain some radio-active material, usually in quantity so minute as to be detected only by very delicate methods. The richest in radium are the igneous granitic rocks; sedimentary rocks have a smaller content. All spring waters which have been in contact with strata containing radio-active material are more or less radio-active. This applies to mineral waters so designated, but whether their therapeutic effects are on that account increased or modified in any way does not seem to be established. The chief sources for the extraction of radium are uraniferous minerals, and the processes utilized are all based on the original method of the Curies and Debierne. The presence of barium is essential, and it is added to minerals which contain an insufficient quantity of this element. Insoluble sulphates are precipitated in the process, and when the residues are sufficiently pure they are submitted to a series

of crystallizations, generally as radium bromide, until the radium has been separated from the barium.

Professor Matignon estimated that down to the end of 1924 a little over 300 grams of radium had been produced. Of these, 23 came from the Joachimsthal mine, and the total European production before the Belgian factory was established was about 60 grams. The Americans claimed that about 160 grams were extracted from carnotite. The rate of production at the Oolen factory in Belgium suggested that by the end of 1924 it had produced 110 grams. Half the total quantity in the world appeared to be in America, where the hospitals and medical institutes owned over 120 grams.

So far its results in treatment are among the most important to which radium to-day is put. Owing to this the output is kept under control in order that supplies may not exceed demand." *Brit. M. J.*, 1928, i, 19.

DECLINING DEATH RATES

"Throughout the country, local authorities are reporting, with satisfaction, rapidly declining death-rates. In England and Wales the rate (standardized) per 1,000 of the population has fallen consistently, as the following figures show:

Average: 1871-1880, 20.3; 1881-90, 18.6; 1891-1900, 18.1; 1901-1910, 15.2; 1911-20, 13.5; 1921-25, 0.9; year 1926, 10.1.

Not so happy, though—at least so many people believe—is the comparatively rapid fall of the birth-rate, which has declined as follows:

Average: 1871-1880, 35.4; 1881-90, 32.4; 1891-1900, 29.9; 1901-10, 27.2; 1911-20, 21.8; 1921-25, 19.9; year 1926, 17.8.

The majority of reviewers of the vital statistics find consolation in the fact that the 'survival rate'—that is, the births minus deaths—is still on the right side. This argument is all very well so long as the death-rate remains at the present low figure, or further declines. Here, however, lies the fallacy.

The Registrar-General's department has calculated that the average expectation of life of every child born is, according to the new life tables, 55.6 years for males and 59.8 years for females, which is some 7 years longer than the experience fifteen years before, and 12 years longer than a generation ago. Yet the death-rate is 10.1 per 1,000 of the population 'standardized,' or 11.6 'crude.' This gives an average age at death on the present population of 86 years on the 'crude' rate, and nearly 100 on the 'standardized'!

How, then, can the expectation of life figure be reconciled with the average at death as measured by the present death-rate? It can-

not; it is only a question of time before the two figures come more nearly into agreement.

The death-rate cannot remain at its present low figure; the greater longevity of the population is masking the true position, a longevity which follows a score of years of great health reforms, leaving so much less scope for similar improvement in the future. The most remarkable improvement has been made in the saving of child life; for instance, the 'standardized' death-rate per 1,000 of the age-group 0 to 5 years has declined from 66.0 in 1895 and 51.2 in 1906 to 23.3 in 1926.

Eventually a 'standardized' death-rate of about 14 per 1,000 (for 15 to 16 'crude') must obtain by which time the birth-rate will, in all probability, have fallen to that figure, if not below."—H. F. H. in *The Statistician*, No. 1.

IRRADIATED ERGOSTEROL

It appears to be definitely settled that in ergosterol which has been subjected to the action of the ultra-violet rays we have a substance rich in vitamin D, and, therefore, particularly valuable in the treatment of rickets. A knowledge of the various forms in which this new remedy can be obtained will be useful to the general practitioner as well as to the actinotherapist. Attempts have been made to prepare a standardized product, and, in some cases, to incorporate other vitamins with vitamin D.

Vigantol has been placed on the market by Bayer Products Ltd., and is a purified and accurately standardized ergosterol, which has been treated with ultra-violet light to a certain definite extent. It can be obtained in three forms: a solution in oil; a sugar-coated ovoid; and a chocolate-coated pellet. The makers claim for it that it is the only preparation in which the amount of vitamin D is definitely mentioned. They state that the solution contains 10 mg. per c.c.; each ovoid contains 2 mg.; and each pellet, 4 mg.

Radiostol is the product of British Drug Houses. It is available also in the form of a solution and a pellet, and combined with extract of malt. The last form is said to contain accurately measured quantities of vitamins A and B. The makers claim that radio-malt has three times the vitamin D activity of the best cod liver oil. They also prepare *radiostoleum*, a mixture of a solution of *radiostol* with a concentrate of vitamin A in a tasteless vegetable oil.

Some makers announce similar products in the form of biscuits and chocolate-coated candies, which will, doubtless, be attractive to children.

A. G. NICHOLLS

THE ART OF INSANE PATIENTS

Art critics of Paris are interested in an exhibit of painting and sculpture by patients afflicted with mental disease, according to reports received by the American Medical Association from its French correspondent.

It is a difficult matter, apparently, to choose between the psychopathic art and the products of the ultramodern school, futurists, cubists and the like. Only the work of patients who were not artists before their admission into institutions, it is stated, are included in the exhibition.

This does not necessarily mean that the ultramoderns, who paint voluntarily the impressions of the subconscious mind, are insane, in the opinion of Dr. August Marie, a well-known French expert on mental disease. Such artists contend that they give free rein to their emotions and depict their inmost dreams without the control of reason very much after the manner of spontaneous art of savage tribes and prehistoric races.

The insane merely describe the vagaries of their subconscious minds and hallucinations for the satisfaction they get out of it. Most of them have no notion of technique, yet one painted in quite unearthly colours, roaring flames and waves of fire worthy of Turner. This picture was bought by a wallpaper manufacturer to serve as the basis of a new wallpaper design. A psychopathic priest depicted a pope blowing soap bubbles before an assemblage of swooning frogs.

The French expert believes that some of the paintings, if removed from their environment and placed in the collections of a reputable dealer, would command high prices.—*Science*, Feb. 15, 1928.

PROFESSIONAL ETHICS

There are 21 acts which are classed as being "derogatory to professional honour" in the code of the College of Physicians and Surgeons of the Province of Quebec, according to a list published by the Registrar of the College, which has been approved by the Lieutenant-Governor-in-Council.

These acts are:

Revealing a professional secret.

Forsaking a patient in danger, without sufficient reason, and without giving such patient occasion of retaining the services of another physician.

Giving, either for the purpose of obliging or for any other motive, false certificates concerning death, kind of sickness, state of health, vaccination, disinfection, eligibility to the privileges of life, sickness and accident insurance.

Habitual use of alcoholic beverages or narcotic or anaesthetic preparations, cocaine, heroin, morphine, ether or other analogous sub-

stances capable of producing intoxication or unconsciousness.

Giving generally, and without medical reason, certificates to allow any person to obtain alcoholic beverages or narcotics.

Selling or giving narcotics without sufficient medical reason.

Having consultations with quacks, bone-setters or other charlatans, and of making any agreement with such for the treatment of any disease whatsoever.

Supplying a quack, bone-setter or other charlatan with reports of examinations, radiographs or any other documents, and information which may allow such a quack to continue the treatment of a patient.

Having brought on an abortion declared by the Court to be criminal.

Carrying on, among the public, either directly or indirectly, an anti-conception or an abortion propaganda.

Sharing between physicians or between physicians and druggists or other persons, of any profits, resulting either from consultations, prescriptions, surgical operations, sale of medicines or apparatus, without the patient having been notified of such participation in the profits by one of the forms determined or to be determined by the Provincial Medical Board for each case in particular.

Inserting in the newspapers, or otherwise spreading among the public, a direct, or indirect advertisement in which the curing of a disease is expressly or implicitly guaranteed.

Employing to designate an apparatus for diagnosis or treatment, or a remedy, expressions which may lead to error as to the nature or

origin or effects of the said apparatus or remedy. (Ex: serum, imported product, specific, etc.).

Publicly recommending the use of a medicine or of an apparatus in the sale of which one has a pecuniary interest without notifying the public of such participation in the profits, according to forms determined or to be determined by the Provincial Medical Board.

Advertising free consultations if not practising in a public institution duly incorporated, recognized for public utility by the Provincial Board and by the Superior Council of Health.

Depositing or posting cards or other advertisements in public urinals, brothels, taverns, pool-rooms, and other similar places or on theatre or other programmes.

Producing false testimonies in the course of an advertisement for a method or a remedy.

Producing, in the course of an advertisement for a method or remedy, certificates in which the patients congratulate themselves on having escaped proposed treatments by other doctors or complain of having been treated without any results, or in any other manner calumniate or slander physicians.

Using on a professional card, office paper, advertisements, interviews or publications, any mercantile forms of expression. (Ex: satisfaction guaranteed; first consultation free).

Accepting of money or of any other advantage or promise of money or advantages whatsoever by a member of the Provincial Medical Board for contributing or for having contributed to the adoption of a process or any decision whatsoever by the Provincial Medical Board.—*The Montreal Star*, April 23, 1928.

Abstracts from Current Literature

MEDICINE

The Diagnosis of Congenital Cardiac Disease.

Abbott, M. E., and Weiss, E., Reprinted from Blumer's "Bedside Diagnosis, 1928, ii, 353-514, W. B. Saunders Co., Phila.

This work is notable as being the first complete monograph on this important subject from the clinical side. Practically all that has gone before has taken the form of pathological studies and classifications, which, from the standpoint of the average practitioner, deal with what are largely medical curiosities. The subject is more important than this, however, and the authors have done well in bringing together such a wealth of material and arranging it in a way that does much to clarify it and make it available for practical use.

Congenital cardiac disease is, then, considered under three main groups: (1) The

a-cyanotic cases, in which no abnormal communication exists between the two circulations, but which are the cause of lowered resistance, or the seat of increased strain; (2) Arterio-venous shunt, with possible transient or terminal reversal of the flow ("Cyanose tardive"); (3) Permanent arterio-venous shunt (true morbus ceruleus).

Under the first group are considered such things as congenital heart block, coarctation of the aorta, and anomalies of the valves, and the rare congenital arterio-venous fistula. In the second category local uncomplicated cardiac septal defects and patent ductus are discussed. In the third, are dealt with all those cases in which the oxygen-unsaturation of the capillary blood is raised above its "threshold value" for the appearance of cyanosis.

The pathological physiology of cyanosis is very fully considered. Methods for the quanti-

tative determination of the amount of shunt are given, based on the work of Weiss and Löwbeer, Boek, Field, and Stoddard.

On page 432 will be found a new and valuable clinical classification of the cyanotic cases, based on the degree of cyanosis and the expectation of life, in which the statistics of 850 cases given in Dr. Abbott's classical monograph in Osler's *Modern Medicine* (3rd edit., vol. iv, 612-812) are analyzed.

This work of Drs. Abbott and Weiss is further notable for the fact that it is very fully and helpfully illustrated with diagrams, skiagrams, and electrocardiograms, usually in juxtaposition, and often together with a picture of the gross specimen. It does not replace the article in *Modern Medicine*, but is complementary to it. While not completely exhaustive, the bibliography is very full.

It may truthfully be said that the authors have produced a monumental work, a marvel of industry, learned, useful, and exhaustive, which will remain the *locus classicus* for a long time.

A. G. NICHOLLS

Experimentelle Untersuchungen Über die Ätiologie und Therapie der Perniziösen Anämie. (Experimental Investigations on the Etiology and Treatment of Pernicious Anæmia). Knorr, K., *Wiener klin. Wchnschr.*, 1928, xv, 514.

This short note on a presently live question emanates from the Third Medical Clinic of the Royal Hungarian University in Budapest. The author promises full details in a later communication.

He has found a Gram-positive diplococcus in the mouth, duodenum and small intestine generally of patients affected with pernicious anæmia. This coccus was agglutinated by the serum of pernicious anæmia patients in a dilution as high as 1 to 320. This fact brings at once to the front the question of its pathogenetic importance.

The injection of this micro-organism into experimental animals produced a toxic anæmia with hyperchromæmia.

Following the oral administration of heterologous strains, sufferers from pernicious anæmia presented an objective improvement and an almost complete disappearance of their subjective symptoms.

A. G. NICHOLLS

SURGERY

The Distal Anterior Closed Space Infection. Carp, Louis, *Surg., Gynec. & Obst.*, April, 1928, xlvii, 484.

The distal anterior closed space is a confined small compartment on the volar surface of the finger. It contains fat pads, fibrous tissue septa, blood vessels, nerves, sweat-glands,

lymphatics, periosteum, and the insertion of the tendon of the flexor profundus digitorum at the proximal end of the distal phalanx. The flexor tendon sheath, which begins at the base of the distal phalanx, is also included in this space.

The superficial lymphatics form a diffuse network and drain into the axilla. Roux believes that there are lymphatics which run perpendicularly from the skin to the periosteum, but these have not been definitely demonstrated.

The author has made a study of infection involving this space and states that in the vast majority of cases the patient has pricked his finger with some sharp object, such as a pin, or a splinter, but in some instances there was only a history of superficial abrasion, or of continued contusion. The infection once introduced may be originally superficial, then extend to deeper parts, or it may be in the deeper parts from the first. In the early stage of the infection, there is no free pus. The infecting organisms in their order of frequency are *S. aureus* and *albus*, the streptococcus, *B. coli*, and, as a contaminant, *B. pyocyaneus*.

The phalanx may become involved in one of three ways: first, through the lymphatics, which run perpendicular to the bone and underneath the periosteum; secondly, by thrombosis of the blood vessels interfering with the blood supply; thirdly, by direct spread of the infection to the medulla through the nutrient foramen. Ordinarily, osteomyelitis begins in the medulla and spreads to the cortex and periosteum, but, in the distal phalanx, on the contrary, the periosteum is the first to suffer. Regeneration cannot take place until the sequestrum has been removed, to allow subsequent periosteal and endosteal growth.

Usually within the first twenty-four hours there is pain as a symptom, which is throbbing in character. As the tissues break down, the pain usually becomes less. The constitutional symptoms are not marked. As the condition progresses there is swelling, redness, heat, and exquisite local tenderness. The most frequent complication of infection in this space is osteomyelitis. Rupture of the infection into the tendon sheath is very unusual. The prognosis in cases treated early and properly is good, the average duration of treatment occupying about three weeks.

In considering treatment, it may be stated that conservative treatment rarely produces a good result. If a blister exists, the removal of the top of the blister, in case there is involvement of only a very small amount of fat, occasionally produces a cure. As a rule, when the diagnosis has been established, surgical intervention is indicated. A general anæsthetic is to be preferred, but, if this is contra-indicated, block-anæsthesia should be used. The incision should cut across fat pads and

fibrous tissue septa transversely, so as to drain the entire area, and should be so placed as to avoid injury to blood vessels, nerves and tendon sheath. This is best accomplished by an incision which will show a half-ellipse or horse-shoe around the end of the finger. This incision may be divided into the lateral, bilateral, or hockey stick types. If sloughs are present they should be removed, as should also a sequestrum or foreign body. Incisions should be packed widely, or, where through-and-through drainage is used, a rubber dam may be inserted as a drain. Drains should be removed in forty-eight hours.

R. V. B. SHIER

Observations on the Prevention of Post-Operative Peritonitis and Abdominal Adhesions.

Johnson, H. L., *Surg., Gynec., & Obst.*, Nov., 1927, xlv, 5.

If we are to understand the formation of post-operative adhesions in the abdomen we must take into account the normal method of reaction to peritoneal inflammation, and on investigation of this it appears that there is as yet no satisfactory method known for preventing this normal reaction from going on to the stage of forming adhesions. It is clear that certain ferments are formed in the exudate, which are capable of digesting proteins, and that it is their action which normally prevents adhesions from being formed. But why these sometimes fail to act, or how we may aid in their action, are problems still under discussion.

A great variety of substances have been used to prevent the formation of these adhesions, some of which, such as boric acid, sodium citrate solution, gelatin, gum, and paraffin, were used in the hope of preventing this normal reaction from taking place. Recent animal experiments by Takahashi Shubota however have shown that the use of these substances in no case prevented the eventual formation of adhesions. On experimenting with papain, a vegetable ferment, which has the property of digesting muscle fibre as well as connective tissue, Shubota found that in certain dilutions this substance prevented adhesions from forming under conditions which in control animals gave rise to strong adhesions. Work along something of the same lines had been done by Naumann, who used methods which he claimed stimulated the production of digestive ferments.

Dr. Johnson now brings forward the idea that amniotic fluid will serve to prevent adhesions, since one of its chief functions is the prevention of adhesions between the fetus and amniotic sac. He found in a number of cases that allowing amniotic fluid to flow freely into the abdominal cavity during Cæsarean section, produced extremely satisfactory results in preventing peritonitis and post-operative adhesions. He then experimented with amniotic fluid on guinea-pigs,

and concluded that there was little doubt that this fluid exercised a distinctly beneficial effect in preventing the development of peritonitis and the formation of adhesions.

Further work is in progress to determine the best and safest methods of employing this fluid. The present paper is to be considered as a preliminary report only.

H. E. MACDERMOT

Malignant Diseases of the Thyroid Gland.

Pemberton, John de J., *Ann. Surg.*, March, 1928, lxxxvii, 369.

This paper embraces a clinical study of 457 cases of malignant diseases of the thyroid, 276 of which were operative cases and 181 non-operative. Carcinoma of the thyroid has an occurrence frequency of 2.7 per cent, as compared with benign nodular tumours, and of 1.66 per cent, as compared with all benign enlargements. Sixty-nine per cent of the operative cases occurred in the fourth, fifth, and sixth decades of life. In 87 per cent of all the cases there was evidence of a pre-existing benign goitre. Sarcoma occurred in 1 per cent; diffuse carcinoma in 25 per cent; carcinoma in fetal adenoma in 38 per cent; and papillary adenocarcinoma in 30 per cent. Malignancy should be suspected in all tumours of the thyroid in which there has been recent rapid growth, with or without hoarseness and paralysis of the vocal cords, even though there is absence of the characteristically hard, irregular, nodular tumour fixed to the neighbouring tissues. Metastasis occurs through the lymph and blood, and is frequent and often early in the course of the disease. The most frequent sites of secondary involvement are: regional nodes 69 per cent; lungs 24 per cent; chest and mediastinum 16 per cent; bones 6 per cent. The adenoma must be looked on as a precursor of malignancy.

The results of surgical treatment were as follows: There were 204 patients operated on from 1907 to 1923 inclusive, and of these 32 per cent are living, after a lapse of from three to eighteen years. None are alive who suffered from sarcoma; but, of those who suffered from diffuse carcinoma, 21 per cent are alive; with carcinoma in fetal adenoma, 38 per cent; and with papillary adenocarcinoma, 48 per cent.

R. V. B. SHIER

OBSTETRICS AND GYNÆCOLOGY

Seltene Ursache einer Scheidenatresie (a Rare Cause of Vaginal Atresia). Heilbronn, S., *Münch. med. Wchnschr.*, 1928, xiii, 569.

The author mentions the usual etiology for this condition, which is not very infrequent: abnormal disturbances during fetal life; as a complication in young children of smallpox, scarlet fever, and diphtheria; and as a result of injuries during operative delivery. He records

a case in which almost complete vaginal atresia resulted from normal, though somewhat protracted, delivery. Pituitary preparations had not been used, nor was any manual or instrumental procedure instituted. When the adhesions were separated, it was found that there was an ulcer, presumably due to pressure of the child's head, on the upper inner aspect of the right labium majus.

A. G. NICHOLLS

PÆDIATRICS

Intradermal Vaccination. Tooney, J. A., and Hauver, R. B., *Am. J. Dis. Child.*, February, 1928, xxxv, 2.

This is an addition to the already numerous reports regarding vaccination against smallpox by the injection of the vaccine into the skin. It has been claimed for this method that the reaction is more complete; that it produces less febrile effect; that it is effective in cases in which other methods of vaccination have failed to take; and that the scar is much smaller.

The present report deals with the vaccinations which have been performed in the Cleveland City Hospital from 1922 to 1927, making a total of about 9,000 in all. The intradermal method was used in all of these. Dilution of the vaccine was made with physiological saline, the contents of a stock capillary vaccine tube being diluted with three drops of saline.

The result was considered positive when a macular lesion developed in from three to six days, pustulated in from five to twelve days, formed a scab by the eighteenth day and healed in from fourteen to twenty-nine days. A reaction was considered negative if no reaction appeared by the seventh day. Many atypical or pseudo reactions were found, in most of which a hard glassy papule was produced in three to six days. In some cases where the injection was too deep, there resulted a hard deep-seated papule, which might remain or not; sometimes it ruptured, sometimes it remained for as long as a month before being absorbed.

These authors found that there was a fever of short duration in most cases, starting as early as six days or as late as fourteen days after vaccination.

The resulting scab is very small, but it is argued that this is no valid reason against adopting the method. It is less painful, since it calls for only one puncture. None of the vaccine is lost, and there is none of the large sloughing of secondarily infected areas. This method can be used in certain skin diseases such as eczema, and bandages and dressings are unnecessary. These advantages are held to outweigh the trouble of preparing the vaccine material and the disadvantage that a certain degree of skill is needed to perform intradermal injections.

H. E. MACDERMOT

OTO-LARYNGOLOGY

Acute Stenotic Laryngitis of Infectious Origin.

Champion, A. N., *Texas State J. Med.*, Feb., 1928.

Acute stenosis of the larynx produces alarming symptoms. Various causes may produce the condition, but the author reports two cases which simulated laryngeal diphtheria, but were due to an undetermined infection.

The first was in the case of a boy, aged 22 months, who, three nights previous to calling a physician, had had a sudden attack of coughing and respiratory distress with a temperature varying from 100 to 103 degrees F. The cough was "barking" in character but was not severe. The voice was husky. The dyspnea was so extreme that the boy was unable to sleep at night. On the second night he had received ten thousand units of diphtheria antitoxin and, when seen by the author, the respiratory rate was very rapid. There was marked inspiratory dyspnea and retraction of the sternum and ribs, but no cyanosis. There was no membrane or exudate visible in the fauces or pharynx. Examination of the chest was negative except for inspiratory wheeze. X-ray examination of the chest did not show a foreign body. The thymus was not enlarged. Throat and laryngeal cultures were negative for *B. diphtheriae*, but positive for staphylococci, streptococci and pneumococci. There was redness and swelling of the arytenoid cartilages, aryepiglottic folds and ventricular bands. The subglottic mucosa was fiery red and swollen, leaving only a slit-like aperture for breathing space. There was no membrane or exudate present. In order to save the patient's life, a tracheotomy was necessary. The patient went on to recovery. The second case was that of the twin brother of the first case, the history and course being very similar.

The exact etiology of these cases is unknown, but it was probably a streptococcus infection. Just why such marked changes in the larynx should be produced is not clear but the author suggests two possibilities. Either the causative organism had a predilection for that site or these patients had a hereditary weakness to infection of the laryngeal tissues. The differential diagnosis was from laryngeal diphtheria, the early stage in measles or scarlet fever, broncho-pneumonia, influenza, angio-neurotic oedema, bulbar palsy, post-diphtheritic paralysis, and foreign body. The final diagnosis rested more upon the laryngoscopic findings than anything else.

The indications for treatment are clear in this condition. There are no specific therapeutic measures, the immediate problem being to provide ample breathing space and this is easily accomplished by tracheotomy. Intuba-

tion is unsatisfactory because the tube traumatizes tissues, is difficult to introduce and keep in place, and there is a very great danger of aspiration pneumonia. Tracheotomy should be done early and should be planned for when the patient finds it necessary to bring the accessory muscles of respiration into play.

R. V. B. SHIER

PATHOLOGY

Branchial Anomalies and Neoplasms. Carp, Louis and Stout, A. P., *Ann. Surg.*, Feb., 1928, lxxxvii, 186.

The branchial anomalies are the branchial cysts and fistulas, cervical and auricular appendages, fistula auris congenita and branchial epithelioma. Various suggestions have been made from time to time as to the origin of these lesions in some remnant of branchial apparatus.

First; the branchial cleft hypothesis, in which it is assumed that the condition is analogous in the human embryo to that of the embryos in lower animals and that branchial fistulas can occur at levels corresponding to the various unobliterated clefts.

Second; Rabl's hypothesis. The author of this hypothesis pointed out that there are four branchial bars. Each is a protrusion with an ectodermal furrow above and below. The first, with its fellow at the opposite side, forms the mandible. The second is known as the hyoid arch. The third furrow becomes the thymus. From studies it is evident that the level of the second furrow is the logical point at which a fistula may enter the pharynx. A third hypothesis is Wenglowski's and a fourth is Fraser's hypothesis.

The authors in the study of their cases found twenty branchial cysts, all of which had a lining of stratified squamous epithelium and all had masses of lymphoid tissue with well-developed germinal centres averaging 1 mm. in thickness in the fibrous tissue outside of the epithelial lining, serving to distinguish them from thyroglossal cysts and fistulas, which are devoid of lymphoid tissue.

In an analysis of cases it was found that, as a rule, the swellings of the cysts gradually increased in size, but some diminished and increased alternately. These remained stationary for a long time, then suddenly became larger. Most of the cysts were located beneath and anterior to the sternomastoid just below the mandible and the majority were encapsulated and fluctuant. Pain was unusual and was mild in character, although infection of the cyst aggravated the pain. In 85 per cent the cysts extended down to the surface of the great vessels. Complications that may occur are fistula formation, a superimposed epithelioma, infection of the cyst, or traumatic rupture.

These cysts have to be differentiated from tuberculous adenitis with or without abscess formation. A single, cystic, painless, moveable, and non-tender swelling, gradually increasing in size and found in the upper half or third of the sternomastoid region is very apt to be a branchial cyst. A solitary broken-down tuberculous abscess, not associated with other enlarged glands, simulates this very closely, but in tuberculosis the overlying skin is more often a dull red and in the roentgenogram there may be seen evidence of calcification. If cholesterol crystals are found in the aspirated contents, an epithelial-lined cyst may be suggested.

Branchial fistulas may be divided into: (1) External complete—those with only an outer opening. (2) Internal incomplete—those with only an inner opening. (3) Complete—those with an internal and external opening. These internal openings are, as a rule, situated along the anterior border of the sternomastoid below the thyroid cartilage, but, when occurring in the midline, thyroglossal fistula must be eliminated. Branchial appendages are soft nipple-like protuberances covered by hair-bearing skin. They are held erect by a central bar composed of any of the three types of cartilage and give a sense of firmness on palpation. Malignant epithelial neoplasms arising from branchial epithelium are relatively rare. The swelling comes on gradually or very rapidly and occasionally a patient states that it diminishes in size. It is situated about the middle third of the sternomastoid region, is nodular, hard, may be cystic and fluctuant in parts, and is adherent to surrounding structures. The pain may be either localized or radiating and associated with this is dysphagia, hoarseness, cough and loss of weight.

R. V. B. SHIER

Carcinoma of the Islands of Langerhans

Wilder, B. M., Allan, Power, and Robertson, *J. Am. M. Ass.*, July 30, 1927, lxxxix.

These authors report a case of carcinoma of the pancreas associated with hypoglycæmia. Convulsions were a marked feature and it was found necessary to administer hourly doses of insulin in order to prevent them. The blood sugar at times fell below 0.003 per 100 c.c. The curve of the blood phosphates followed that of the blood sugar.

Autopsy revealed a liver weighing 3300 grm., and containing 8.25 per cent of glycogen. There was a carcinoma in the pancreas, with secondaries in the liver and lymph-nodes. It is worthy of remark that the cells of the carcinoma resembled those of the Islands of Langerhans, and that alcoholic extracts of the cancerous liver nodules produced the same effects as insulin when injected into rabbits.

A. G. NICHOLLS

Die Bedeutung der Wirbelsaule für die Entstehung eines Ulcus Ventriculi (Duodeni). (The Significance of the Vertebral Column in the Causation of Peptic Ulcer). Plaschkes, S., *Wiener klin. Wchnschr.*, 1928, xv, 516.

In addition to the more commonly accepted factors in the etiology of peptic ulcer, of a traumatic, chemical and biochemical, embolic, inflammatory, neurogenic, and mechanical nature, it is being generally accepted that local factors, operating upon the stomach directly, are of importance.

The author has noted gastric ulcer developing in patients with lesions of the vertebral column, and thinks that there is a definite connection between the two. He refers to fifty cases of gastric or duodenal ulcer which he found in connection with severe vertebral deformities. Generally, there was marked lordosis or scoliosis, producing mechanical pressure on the stomach. He gives an analysis of his cases and a short abstract of the literature.

The author concludes by expressing the opinion that, in some degree at least, and by a similar mechanism, the normal vertebral column may play a part in the causation of peptic ulcers.

A. G. NICHOLLS

THERAPEUTICS

Serum Treatment of Pneumonia. Bullowa, J. G. M., Rosenbluth, R. B., and Park, W., with Miss G. Cooper, *Bull. N.Y. Acad. Med.*, March, 1928.

These papers constitute a symposium on the use of anti-pneumococcic refined serum in lobar pneumonia. The first paper deals with the necessity of having a control series of cases by which to judge of the value of the serum treatment. This was carried out in the Harlem Hospital by placing each alternate patient with pneumonia in the serum series. In other respects all cases of pneumonia received the same treatment. Each case was then "rated" in accordance with a definite category of symptoms, which provided still further data by which to judge the effect of the serum.

In this way, a series of 365 cases were studied, 169 of which were treated with serum and 196 were not. Analysis of these showed that early hospitalization was not the cause for better results with the serum, since the mortality was less amongst the serum cases than amongst the controls whether admission was early or late in the disease. The serum also definitely shortened the illness of those who recovered, and apparently delayed death in the fatal cases. The most marked effect of the serum treatment was

among Types I and II. Types III and IV were not benefited to any extent.

Dr. Rosenbluth's contribution is in regard to bacteriemia in pneumonia and its relation to prognosis and serum therapy. Blood cultures were made on 500 patients, and positive findings were obtained in 35 per cent of Type I cases, 31 per cent of Type II, 25 per cent of Type III, and 7 per cent of Type IV. It is pointed out that there is a striking lack of unanimity as to the prognostic value of a positive blood culture in lobar pneumonia, those who find a high incidence of bacteriemia attaching but slight importance to it, whilst those who report a low incidence regard it as a very serious prognostic sign. Dr. Rosenbluth holds that the important point is the degree of bacterial invasion present. Probably all or most cases would yield positive blood cultures if enough blood were used, and if cultures were made at short intervals. But the significance of a few bacteria thus demonstrated should certainly be distinguished from a bacteriemia which is easily shown in one or two cubic centimetres of blood. In the latter case the prognosis must be held to be definitely bad.

He concludes that type specific serum is particularly indicated in cases showing a bacteriemia. In the negative cases serum should be used to prevent the development of bacteriemia. All Type IV cases, with positive blood cultures, should receive serum, since they may later prove to be Type I or II. The serum should always be given at the earliest possible moment. The effect of serum on the mortality in pneumonia seems to be exerted chiefly on those with bacteriemia, those with negative blood cultures being relatively little benefited.

As regards the method of administration, Dr. Park states that when the serum available can safely be given intravenously, then it should undoubtedly be so given, so that the whole amount of antibody may be made immediately available, instead of waiting for the gradual absorption which takes place when it is given intramuscularly.

The first injection should be large, as nearly as possible 10,000 units of the type indicated. Dr. Park deplores the present lack of standardization of the sera, in some of which the dosage is according to the number of cubic centimetres rather than units of antibody. He hopes that before long the Hygienic Laboratory will require the units for each type to be stated on the package, just as it is in the case of diphtheria and other well established antitoxins.

He recommends giving Types I and II on admission of the case, and then as soon as typing has been done, or if the temperature remains high, or bacteriemia is shown to be present, the injection of a monovalent or polyvalent serum (in the case of Type IV) should

be continued every eight to twelve hours. In the case of Type IV, however, it is well to stop with the third injection, since the antibody for the types assembled as Type IV has not yet been made effective enough. The same rule applies to Type III.

A secondary rise of temperature calls for further injections of serum, unless the rise is known to be due to some complication. It is hoped that within a year or two refined serum will be available in large quantities.

H. E. MACDERMOT

The Treatment of Epilepsy. Collier, J., (Lumleian Lectures, 1928), *Lancet*, 1928, i, 687.

Dr. Collier points out that the life of the epileptic should be that of the ordinary person, without removal from school or ordinary activities. He does not believe that digestive troubles, constipation, ileal stasis, nasal obstruction, etc., (except rickets) have any real effect in causing epilepsy.

He recommends the use of luminal in moderate doses (gr. 1½), and sodium bromide (gr. 20), the object being to anticipate the fit. If the attack is nocturnal, he gives a single dose at night; if diurnal a single dose in the morning; if both diurnal and nocturnal, a dose night and morning. "Inasmuch as the attacks occur at regular intervals and can be anticipated one hour by a dose of the remedy, the epilepsy can be the more successfully treated."

The only other remedies which, in his opinion, really influence epilepsy are the zinc salts and belladonna; in a few cases these are of signal benefit. These are generally cases in which both luminal and bromides have failed.

Status epilepticus is utterly rebellious to the remedies mentioned. Bodily nutrition and strength must in this condition be carefully preserved by careful watering and feeding and by the use of stimulants, given by nasal tube. No depressants such as luminal, bromides, morphia or chloroform, should be used, as they do harm.

Paraldehyde given in large doses up to 8 drm. by the rectum in olive oil is readily absorbed. He claims to have saved many cases of status epilepticus in a desperate condition by this treatment. Paraldehyde is useful in any epilepsy in which the convulsive attacks are of frequent occurrence.

The medicinal treatment outlined is applicable to every form of epilepsy, idiopathic, organic and symptomatic, also in migraine, vaso-vagal and syncopal attacks which are closely related to epilepsy.

J. W. S. McCULLOUGH

De la Valeur du Chlorure de Sodium Employé en Solution Hypertonique et à Haute Dose Comme Moyen Curatif ou Préventif de l'Intoxication dans les Occlusions du Tube Digestif. (On the value of Chloride of Sodium used in Hypertonic Solution and in Large doses as a Curative or Preventive Measure in the Intoxication due to Occlusion of the Alimentary Canal). Gosset, A., Binet, and Petit-Dutaillis, *La Presse Médicale*, Jan. 7, 1928, ii, 17.

In cases of acute obstruction in the alimentary tract it is not uncommon to find patients dying from acute intoxication in spite of the fact that the obstruction may have been relieved surgically.

Experimenting with dogs, the authors have found that, in some cases, it was possible to prevent a fatal result under these circumstances by the use of sodium chloride in large doses and in concentrated solution. They record two fatal cases which demonstrate this fact in a striking fashion; the symptoms were relieved by the procedure, only to recur when the medication was interrupted. The authors conclude that chloride of sodium is helpful and consider that their method of treatment is indicated in gastric tetany, acute duodenal obstruction after operation, and in all occlusions of the small intestine.

A. G. NICHOLLS

ANÆSTHETICS

The Use of Carbon Dioxide During Induction and Maintenance of Ether Anæsthesia.

Lakin, H. A., *Current Researches in Anæsthesia and Analgesia*, 1928, March-April, p. 85, et seq.

The writer gives his patients 30 per cent carbon dioxide in oxygen to breathe before commencing the administration of ether. The ether is turned on gradually or suddenly. There is no struggling, no excitement, no choking, breath-holding or cyanosis. Most of his patients say they do not smell or taste the ether. It is rarely necessary to use carbon dioxide after anæsthesia has been established, since a good colour is usually maintained throughout the operation. Post-operative nausea and vomiting are rare. In only one out of eighteen cases of operation upon the gall bladder was there any vomiting. By increasing the volume of air breathed four or five fold, a low percentage of ether can be employed and irritation of the lungs avoided.

W. B. HOWELL

Further Researches in the Explosibility of Anæsthetics. Horner, A. P., and Gardiner, C. B., *Current Researches in Anæsthesia and Analgesia*, 1928, March-April, p. 69, et seq.

Concentrations of ethylene in air, varying from a minimum of 4 per cent to a maximum of

14.5 per cent are explosive. In mixtures of ethylene and oxygen explosions occur from an ethylene concentration of 5 per cent to 70 per cent. The addition of small percentages of carbon dioxide lessens the chance of an explosion. Before starting the flow of ethylene in a gas machine, a preliminary flushing out with carbon dioxide would completely prevent an explosion at the time it was most likely to occur.

W. B. HOWELL

The Medico-Legal Aspects of Deaths under Anæsthetics. Cowburn, A. D., *Proc. Roy. Soc. Med.*, March, 1928, p. 766, et seq.

In 1903 the Council of the Coroners' Society of England advised their members that "inquests should be held on all deaths occurring whilst under the influence of an anæsthetic,

irrespective of whether the friends of those specially concerned in the administration of the anæsthetic and the operation were satisfied in every way or not." In view of the wide power of discretion vested in coroners by the Coroners' Act, 1926, it is now possible and permissible to differentiate between those cases where death has occurred as a result of disease, and in which the operation and the anæsthesia were mere necessary incidents of treatment which has been rightly adopted as a matter of imperative necessity, and those cases in which an accident has occurred either before, during or after operation or anæsthesia. The copy of a form to be filled out by the surgeon, anæsthetist, pathologist, and nearest known relation of the patient is appended. The form is to be sent to the coroner.

W. B. HOWELL

Obituaries

Dr. James Perrigo, one of the few remaining old-time practitioners, and a unique figure in Montreal, died at his residence on May 6th, in his eighty-fourth year, after an illness of six weeks.

Dr. Perrigo was born in Montreal and educated at the Montreal High School and McGill University. He received his B.A. degree and his Doctorate in Medicine (1870) at the latter institution. After graduating, he continued his studies in Europe, and obtained the diploma of M.R.C.S., Eng. Returning to his native city, he began at once the practice of his profession.



Dr. James Perrigo

In the early years he was associated with the late Sir William Hingston, and their experiences afforded him pleasant recollections which he delighted to recall.

Dr. Perrigo was one of the original founders of the Medical Faculty of Bishop's University in which he occupied several chairs at various times during the whole period of its existence, including that of Professor of Surgery and Gynaecology. He was also an active member of the medical staff of the Western Hospital, Montreal, during his whole professional life. These interests, with his extensive general practice, absorbed his entire attention during his long and successful professional career. He was twice President of the Montreal Medico-Chirurgical Society.

In 1886, Dr. Perrigo married Miss Marion Chandler, of Montreal, who survives him with one son and three daughters.

Dr. Perrigo loved the "big out-of-doors," and it was his delight to pack his kit and betake himself to the woods early in October, for his annual holiday. He continued these hunting trips until three or four years ago. He was, also, a lover of good horses, and for fifty years his turn-outs were unsurpassed, and none were better known from one end of the island to the other.

Dr. Perrigo was generous and loyal to his confrères, whose confidence he enjoyed, and was always ready to give the helping-hand to any who might desire his assistance. He graciously accepted the newer methods, but always hoped that laboratories and mechanical contrivances would not destroy altogether the "humanities" and the art of medicine. He was wont to say, "There is still such a thing as clinical medicine. We have been given five senses, pray, let us use them."

F. R. ENGLAND

AN APPRECIATION

The recent death of Dr. James Perrigo removes from the arena of the active practice of medicine one of the oldest of our general practitioners. Few of our craft have ever reached his great age—eighty-four—for, as the history of our busy practitioners proves, constant physical and mental strain becomes a menace to longevity. But Dr. Perrigo was a vigorous man, both physically and mentally, temperate, and careful of himself, so that the demands of an unusually active and helpful life seemed to leave few marks, and his years lay lightly upon him.

Dr. Perrigo's death removes, also, the last of the

group of medical men who constituted the original staff of the Medical Faculty of the University of Bishop's College, organized in Montreal in 1871. The other members were Drs. W. H. Hingston (afterwards Sir William), A. H. David, R. T. Godfrey, J. L. Leprohon, F. W. Campbell, E. H. Trenholme, J. D. Edwards, R. A. Kennedy, William Gardner, George Wilkins, and S. E. Tabb. Dr. Perrigo was one of the strong members of the Faculty, and at the time of its amalgamation with the medical school of McGill University in 1905 was Professor of Gynecology. Conservative, sound in judgment, he was not voluble in discussion, and when his opinion was once given it was seldom diverged from. He was successful as a teacher, and endeared himself to the students by his keen interest in their welfare.

Dr. Perrigo was one of the founders of the Women's and Western Hospitals, being Acting-Superintendent of the latter institution for many years. His arduous and valuable efforts on behalf of the Western Hospital were fully recognized by the Governors, who, a few years ago, placed an oil painting of the doctor in the Board Room.

Thus his life passed, his interests being centred about the College, the Hospitals, and practice. He had all the attributes which we see in surgeons who have attained eminence. He was calm, courageous, self-reliant, possessed sound judgment, and marked finesse in technique, and was not disposed to adopt new procedures that were not well tested.

While dignified, even somewhat stern in manner, there was a kindliness in his nature that gained him respect and trust and many friends. His loss is a disaster to the community beyond ordinary appreciation.

J. B. McCONNELL

Dr. G. R. J. Crawford, of Saint John, died on April 25th following a short attack of pneumonia.

Dr. Crawford was one of the few remaining members of that group of eminent physicians who, in the last generation, did so much for hospitals and medicine in general in New Brunswick.

He studied medicine originally in the United States, later at Moorfields Hospital in London, specializing in eye, ear, nose and throat surgery. He was successively house surgeon, attending physician, and commissioner at the General Public Hospital in Saint John, and had been in retirement for some years.

Dr. George Devey Farmer died suddenly in Ancaster early in May. Dr. Farmer was a member of a family well known in South Wentworth and about Ancaster, where his people had lived for the greater part of a century. He had practised in the village since his graduation in 1891. At the outbreak of the World's War, Dr. Farmer was placed in command of the 5th Field Ambulance, and as its commander saw active service from the beginning.

Dr. A. J. Fuller. Another prominent member of the medical profession in Nova Scotia passed away on May 11, 1928, in the person of Dr. Albert James Fuller of Yarmouth. Like many other Nova Scotians he taught school for a number of years. He graduated from Bellevue Hospital Medical College in 1886, and has practised in Yarmouth continuously since 1888.

Dr. Fuller was a man of marked intelligence and energy, with great executive ability. He thus held a foremost place in the profession and in the civic life of the community. He was a Councillor, twice a Mayor, active in politics and a strong supporter of his church and all philanthropic organizations. He was a man of strong opinions, and had the ability to present his views

vividly and convincingly. In every undertaking he gave his best service. He was a constant attendant at medical society meetings and always made valuable contributions to the discussions. He is survived by his widow, three sons and two daughters. Dr. C. K. Fuller of Yarmouth is a son. Dr. L. O. Fuller of Shelburne is a brother of the deceased.

Dr. Charles A. Hamilton, of Mahone, died at his home on May 9th, 1928, after an acute illness of only one week, although he had been in poor health for several years past. He was in his sixty-ninth year. He was a graduate of Dalhousie in 1891 and had practised in Mahone since 1892.

Like most doctors, who practise for many years in one locality, he was greatly appreciated by the people in his district, both for his professional ability and for his general knowledge and culture. He had a provincial standing as a scientist, botanist and archeologist. Not long since he donated to the Department of Geological Survey at Ottawa a very valuable collection of seaweeds.

Dr. Hamilton was a constant member of medical societies, being twice President of the Lunenburg-Queens Branch of the Medical Society of Nova Scotia. At the last meeting of the Provincial Society he was elected an Honorary Member, as one "who had conducted himself in accordance with the best ideals of the profession" for many years. He was an omnivorous reader, and possessed a wonderful memory, which enabled him to offer some comments on nearly all papers presented at any medical meeting. He never missed a provincial meeting if it were possible for him to attend.

To Mrs. Hamilton, who has for many years been prominent in community welfare, his two daughters and a son, the Medical Society, by letter and floral tribute, extended sincere sympathy.

Dr. J. O. MacGregor, of Waterdown, the dean of the profession in the County of Wentworth, died early in April. Dr. MacGregor had practised in Waterdown for fifty-three years and was known throughout the county as a physician of exceptional worth. In addition to his practice he had long been interested in the militia and had taken active part in local and provincial politics.

Dr. Howard Miller. The death of Dr. Miller at his home in Victoria, on May 2nd, deprives the medical profession of Victoria of one of its most promising members. Born in Topsail, Newfoundland in 1890, Dr. Miller went to Victoria when three years of age. He was educated in the Victoria Public and High Schools and later went to McGill University to study medicine. Graduating in 1916 he immediately returned to Victoria, entered the Canadian Army Medical Corps, went overseas and was attached to various military hospitals for the duration of the war.

Dr. Miller's loss will be particularly felt in the work of the service organizations of Victoria in which he was an important factor. He had been a member of the Kiwanis Club almost since its inception, three years ago served as its President, and was prominently identified with all the projects for community betterment with which the organization was connected. Dr. Miller was keenly interested in the hospitals and did valuable work on the consultant staff of the Jubilee Hospital. He was a member of the Victoria Medical Society, Canadian, and British Columbia Medical Associations.

Unselfish, loyal, genuine, and always friendly in his relations with mankind, Dr. Miller had a host of friends who will poignantly regret his untimely passing, and who will deeply sympathize with his wife and children in their sad bereavement.

News Items

GREAT BRITAIN

Sir David Ferrier

The death of Sir David Ferrier at the age of 85, on March 19th last, has been the occasion of many tributes and appreciations. Dr. S. A. Kinnier Wilson writes:

"Sir David Ferrier was the last of the small and choice company of pioneers through whose labours the scientific neurology of to-day has come into being. Nearly sixty years have passed since he commenced researches on the functions of the central nervous system that brought him world-wide distinction and made his name familiar wherever neurology was taught. With those of Hughlings Jackson, Horsley and Gowers, it will ever take that honoured position in the memorials of neurological science reserved by common consent for the path-makers and the masters. He was witness of the transition of knowledge of the nervous system and its diseases from the stage of empiricism and lucky guesses to its fruition in the fertile soil of accurate neuro-anatomy and experimentally proved neuro-physiology, and was himself one of the protagonists in this amazing evolution. The commonplaces of neural doctrine to-day were the discoveries of his early manhood, and we of a succeeding generation can appreciate but faintly the new world then revealed by the objective methods of precise cerebral experimentation. More than forty years separate us from the International Congress of 1881, when Ferrier gave a brilliant demonstration of the novelties of cerebral function and localization before the assembled savants of Europe; and fifteen years, too, have elapsed since their successors hailed him at the Congress of 1913 as the doyen of English neurology. If in these later times his work was less often referred to, if the echoes of old controversies had long since died away, if clinicians and surgeons cultivated the neurological field without a thought of the wilderness which it had replaced, a moment of quiet consideration would always bring to the mind of those who knew him and worked with or for him an impressive sense of the debt neurology owed to his imagination and to his persistence in following the path of minute and exact experimental research. Only a few of his friends are aware of the personal abuse which this line of investigation brought him, or of the extremes to which his opponents went in their endeavour to discredit his achievement.

It is on his many services to the experimental physiology of the nervous system that his reputation rests securely, nor can it be diminished by any contention that the technique was comparatively simple, and that the material lay ready to his hand and was only waiting to be utilized. Subsequent studies have not altered his conclusions fundamentally, even if the growing point of neurology has moved away somewhat from the rather schematic parallel he drew between excitation and response, between structure and function. To many of the younger generation he was known only as a clinician and clinical teacher, and this was possibly not the most original side of the man. A shrewd observer and a keen student of human nature, his contributions to clinical neurology are none the less by comparison not so memorable or so abundant. He had not Jackson's breadth of vision, or Gower's faculty of patient and painstaking clinical scrutiny; what struck all those whose contact with him was of later period was his mental vigilance and his consuming desire for information. Long after his

best years had passed he was still a frequent attendant at meetings of the Neurological Section, the College, and the Royal Society, and within a few months of his death was still to be seen on occasion in the library of the Royal Society of Medicine. Nothing was more typical of Ferrier than this hunger for knowledge. On the day of Jackson's funeral in 1911 I walked away with him from the cemetery, and after many minutes of silence, occupied with his own thoughts of his teacher and friend, he suddenly turned and said, "Well, when I cease to take an interest in things it will be time for me to go." Those of us who were associated with him professionally and otherwise, who experienced his generosity, or who knew a little of that side of him that was but seldom revealed, will like to think of Sir David Ferrier as one whose life illustrated in perfection the meaning of the love of knowledge for its own sake, and who carried undimmed to the end the torch of science put into his hands sixty years before."

Dr. R. Crawford contributes the following: "From an acquaintance of nearly forty years with him, first as my teacher and afterwards as my friend, I should pick out as most characteristic of the man two features—first, tireless activity of mind and body, and second, as a consequence of the first, the faculty of keen interest in everything that came under his notice. These qualities were appropriately tenants of a frail, brisk, dapper person, with a quick, springy step, and a face and eyes of penetrating keenness and alertness. He was a fine sample of that peculiarly Scotch product of combined graduation in honours in Arts and Medical Science, and was ready on occasion to improve a situation by an apt quotation from Horace. He always regretted that the exigencies of medical education compelled him to confine his clinic at King's College Hospital to neurological cases, and constantly urged me, when his house-physician, to show him cases of general medical interest. I recollect well his keenness to see the Widal reaction, newly introduced into clinical medicine, put to the test on the many typhoid patients that in those days thronged the wards; and when his turn came for a clinical lecture he would deliberately choose some subject outside his daily round of work, such as myxedema, for his theme. On holiday, as at work, he retained the same boyish keenness on everything about him; he was never more happy than in the seaside cottage at Porthgwarra, where he spent many summer holidays, going to sea in all weathers in an open boat, and living the primitive life of the fisher-folk. In London one would often meet him at private views, and with a wide acquaintance in the world of artists he combined an appreciative knowledge of modern art.

After his retirement from practice his interest in medical science remained unabated. There was no more regular attendant than he at the lectures in the College of Physicians in recent years, and he loved to keep touch with the College that had bestowed on him all its highest honours and offices short of the Presidency, for he had been both Censor and Senior Censor, as well as holding several lectureships and gaining those prize medals bestowed only on men of the highest distinction.

One last tribute I desire to pay—a tribute to the indomitable determination with which, for the last two years of his life, he faced and fought the physical disability, engendered by a very grave illness, such as

most men would have accepted as a sentence of complete and final disability."—*Brit. M. J.*, March 24, 1928.

Celebration of the John Hunter Bicentenary at St. George's Hospital, London

"The two Hunterian Societies—one of them the Hunterian Society of London, founded in 1819, and the other the Hunterian Society of St. George's Hospital, founded in 1832, united at St. George's Hospital on March 1st to celebrate the bicentenary of John Hunter's birth. The gathering, which was of the nature of a conversation, took place in the board room—not the board room of John Hunter's time, which has disappeared, but on almost the same site. Behind the speakers was the couch on which Hunter died, his portrait was over the mantelpiece, and various prized writings and other relics of him were on exhibition. Dr. Hugh Gainsborough, who presided, said that St. George's Hospital, in which Hunter worked and died, was the most appropriate of all places for a celebration, for the proudest of many proud boasts of St. George's was its connection with Hunter."

After the opening address by Sir Humphry Rolleston, Sir Crisp English delivered a brief appreciation.

"What body of people, he asked, could make the greatest claim to John Hunter? Hunter was born in Scotland, but Scotland did not seem to have appropriated Hunter in the same way as Lister. It might be that Scotland had not taken much notice of John Hunter because, when he came to years of discretion, he left that country and started for the south. The Royal College of Surgeons of England had rather annexed Hunter, but it was worth remembering that Hunter's collection did not reach the College until seven years after his death. It was a remarkable thing that the House of Commons, which so seldom showed any practical interest in science, should have voted a large sum for Hunter's collection, and that at a time when Pitt was calling for money for munitions of war. Leicester Square might possibly put in a claim for Hunter, for there it was he started his collection. In Leicester Square, too, lived Sir Joshua Reynolds, and it had been said of Hunter and Reynolds that each helped the other to immortality, the one as subject and the other as painter. But St. George's claims stood out above all others, for Hunter was first surgeon to the hospital from 1768 until his death. He was never an assistant surgeon, and no doubt was truly grateful for that. He was probably a difficult person to get on with, continually at loggerheads with his colleagues, of whom he wrote as a 'damned disagreeable lot.' Reynold's picture, on the other hand, conveyed a different impression of him, which they would like to retain, and Edward Jenner and other pupils, who probably had a better knowledge of him than anybody else, always called him the 'dear man.' The speaker commented on some curious things in the Reynolds portrait—the expression of power in the face, the uncomfortable position of the left hand, the fact that there were two inkpots on the table, both closed, though Hunter held a pen in his right hand, and the bigness of the right arm as compared, so it seemed to him, with the left.

Mr. R. R. James, dean of the medical school, exhibited the pupils' register for 1756, in which one of the first names entered was that of "Mr. Hunter." He also showed an original letter, dated 1765, which, though written in the third person, was unquestionably, in his view, in John Hunter's hand. In that year there was a vacancy for a surgeon, and the letter was to explain to the board Hunter's position why he

did not apply against his rival John Gunning, who obtained the post. Another exhibit was a house-surgeon's certificate of 1769, signed by Hunter and others. The pupils' register of subsequent years, which was also produced, showed the much greater number who entered under Hunter, and reminded one of the famous squabble which reached its climax at the special court in 1793. A poignant exhibit, not for what it showed, but for what it omitted, was the minute book of the weekly board for Wednesday, October 16th, of that year. It was a very small meeting: only four were present. After some trifling matter about coffins and shrouds, which the hospital was going to receive cheaply, it was ordered that Mr. Hunter's letter relating to pupils should be reserved for future consideration, and the meeting passed to the next business. Of the fact that Hunter's death took place in the adjoining room during that meeting there was no mention.

Mr. Mortimer Woolf, president of the Hunterian Society of London, said that that society existed, not for any claim it could lay to John Hunter, but solely to perpetuate the memory of a great man."—*Brit. M. J.*, March 10, 1928.

Now that the motoring urge is in full swing, and the "open season" for pedestrians is now on, the important matter of death and injury by accident again comes to the fore. With the enormous increase of motor cars it is to be expected that this particular matter will become more insistent as time goes on. An important phase of it lies in the fact that so many demands are being made on hospitals for the care of those suffering from motoring accidents that their duty to what may be called their more legitimate cases is being interfered with. Mr. J. C. Buchanan, Secretary of the British Hospitals Association, is quoted as follows: "Hospitals throughout the country are overcrowded with injured patients from other parts. In many cases patients are unable to secure beds in the hospitals which their district supports because they are full up with people from other places. We are considering an amendment of the law to enable voluntary hospitals to include in their expenses, statements of claims arising from motoring accidents."

A picturesque custom, dating back to the reign of Edward III, is the distribution of the King's Maundy gifts to poor, old, and infirm men and women. This is done just before the King's birthday at a special service held in Westminster Abbey, this year on April 5th. The Maundy money is minted for the purpose in silver pennies, two pences, and four pences, and is distributed in little red and white leather purses tied with long strings of the same colour, each purse containing a penny for each year of the King's life. In addition to this, each man receives £4 5s. in lieu of the clothing and provisions that used to be given in kind, and each woman 10s. less.

The ceremony while simple, is very dignified and impressive. A peculiar feature of it is that the clergy carry little bunches of sweet herbs. This has a historical significance. During the plague years sprigs of rosemary were sold in the streets of London as prophylactics for the disease. The scent was thought to have disinfectant powers, but possibly also the plant was considered to be invested with magical properties, in fact to act as an amulet. The custom of carrying protective herbs is still maintained in the Maundy money service, though the cause for it has long disappeared, and the explanation not evident at first sight.

NOVA SCOTIA

At a recent meeting of the Board of the Hamilton Memorial Hospital, North Sydney, it was decided to enlarge the hospital by the construction of an additional wing. It is understood that the work will be proceeded with at once.

The new building of the Sutherland Memorial Hospital, Pictou, is nearing completion, and will be open for the reception of patients within a few weeks. The new hospital will accommodate twenty patients. A very small balance remains to complete the payment for the new building, and a campaign has been initiated to raise this balance and to secure funds for the purchase of some special equipment, and as a nucleus of an endowment fund.

The Sydney City Hospital will celebrate National Hospital Day with appropriate ceremonies.

The Municipal Council of Colchester County has agreed to increase its grant to the Colchester Hospital, Truro, to the extent of six hundred dollars per year. In so doing, the Municipal Council divides with the Hospital Trust the interest on money borrowed to complete the construction of the hospital.

Dr. Ross Millar, who was appointed Medical Director-General of the D.S.C.R., some time ago, recently paid a visit of inspection to hospitals in Nova Scotia, in which former soldiers are being treated. His visit to Amherst, where he resided for many years, was signalized by a complimentary banquet tendered him by the citizens of Amherst, at which he was made the recipient of a very handsome gift.

The Victorian Order of Nurses is gradually extending the scope of its activities in Nova Scotia. Reports of annual meetings of branches in various towns indicate that this most essential organization is at least holding its own in all the towns in which it is established. A new branch is now being organized at Lunenburg, which, it is expected, will be in active operation on the first of June.

In an analysis of the Vital Statistics for the six years 1921-26, Dr. A. C. Jost, Provincial Health Officer, points out that throughout this period there has been a consistent and rather alarming decline in the birth-rate, from 24.85 to 20.78. Dr. Jost states that, while in the earlier years of the period, younger mothers (14-30) did not contribute to the birth rate in the same proportion as those of 31 and over, this discrepancy has very materially increased, and it has been the younger mothers more particularly who are responsible for the decline in the birth rate.

D. Atkins Smith, a graduate of the Nova Scotia Agricultural College at Truro, and until recently employed as chemist at the steel plant of the British Empire Steel Corporation, Sydney, has been appointed Town Sanitary Inspector of Glace Bay. Last autumn there was much cholera infantum in Glace Bay and the vicinity, and precautions are being taken to prevent a recurrence of the condition this year. It will be Mr. Smith's particular duty to see that the general sanitary conditions of the town are made as good as possible, and to maintain a close supervision of the production and sale of milk.

A particularly pleasing feature of the closing meeting for the session of the Halifax Branch of the Medical Society of Nova Scotia was the election of Mr. Wallace W. Kenney to honorary membership in

the Society. Mr. Kenney has been superintendent of the Victoria General Hospital for nearly thirty years, and during this time has necessarily been brought into intimate association with the profession. During his long period of service at the hospital, he has striven to enhance the usefulness of the institution, and under his guiding hand the institution has not only increased much in size but also in efficiency and has held throughout the confidence of the profession and public alike. While the constitution of the society has for years allowed the election of non-medical men who have rendered eminent service to medicine, this is the first occasion in which a layman has been so honoured and it will be very generally agreed that no happier choice could have been made of a first recipient of the distinction.

During the last session of the Provincial Legislature, an Act was passed amending the Medical Act. Previously the Board was constituted of nine members appointed during pleasure by the Government, and six members elected by the Medical Society of Nova Scotia for periods of three years. As amended, the Government appointees will hold office for three years, but will be eligible for re-appointment, and the Government may remove any member of the Board upon due cause being shown. In April, Drs. M. A. MacAulay, E. V. Hogan, Halifax; J. A. Sponagle, Middleton; M. Sullivan, Glace Bay; J. W. McLean, North Sydney; E. E. Bissett, Windsor; F. C. Lavers, New Ross; J. C. Morrison, New Waterford; were removed from membership on the Board by Order-in-Council, and the following were appointed to the vacancies thus created: Drs. O. B. Keddy, Windsor; Hon. W. N. Rehfuess, Bridgewater; W. N. Cochran, Mahone; F. R. Little and John Rankine, Halifax; B. E. Goodwin, Amherst; Allister Calder, Glace Bay; Hon. B. A. LeBlanc, Arichat. W. H. HATTIE

The Medical Society of Nova Scotia is already taking steps to suitably observe its 75th anniversary. It is proposed to hold it early this fall, the celebration being postponed from July till later, in order not to detract from the attendance from Nova Scotia at the Canadian Medical Association meeting in Charlottetown. Besides this historical event it is also proposed to hold the Annual Refresher Course of Dalhousie Medical College during the same week. Then the Medical School has a Golden Anniversary of its own, which will be marked by suitable ceremonies at the same time. There is thus promise of a busy and profitable medical week.

Dalhousie Convocation this year was held on May 15th, when one hundred and forty degrees were conferred. Twenty-five graduates received the M.D., C.M., and five the D.D.S. The University Medal in Medicine was won by Dr. J. W. Merritt, of Springhill. Fifteen of the Medical Graduates were from Nova Scotia; four from Prince Edward Island; and one from New Brunswick. There was but one lady graduate, Miss Munn, from Prince Edward Island. It was rather unusual that no member of this class was from Newfoundland, although there are a number from the sister Dominion in the undergraduate classes. Mr. J. Hugh MacLennan, son of Dr. S. J. MacLennan of Halifax, recently elected a Rhodes Scholar, was awarded the Governor-General's Gold Medal. He graduated in Arts. While the total number of degrees conferred this year fell short of the record number of last year, it is admitted that the year's work was as satisfactory as any in the history of the college.

The rather intensive campaign against tuberculosis

carried on at the present time in the Maritime Provinces has enlisted the services of another recent graduate of the Dalhousie Medical College. Dr. P. A. Creelman, a graduate of 1925, begins his duties as special tuberculosis clinic examiner for Prince Edward Island on July 1st.

The May issue of the *Bulletin* comments upon the visit of the British Medical Association to Canada in 1930, and points out that it is proposed that some of them visit the Maritime Provinces. The feeling is that the powers that be would be well-advised to see that very definite arrangements are made so that these visitors shall see the Maritimes. From every point of view there can be no two sides to this matter, yet it has not always received the thought and planning that is its due right. We feel that their knowledge of Canada will be incomplete unless they see the Maritimes.

NEW BRUNSWICK

Dr. L. M. Curren, of Saint John, recently spent a few days in Montreal visiting medical friends.

Dr. and Mrs. L. R. Murray, of Sussex, were the recipients of a presentation from their friends on the occasion of the twentieth anniversary of their wedding.

Dr. C. M. Kelly with his family, was a passenger on the *S.S. Montrose* recently, when the liner was seriously damaged by collision with an iceberg. Dr. Kelly intends to spend some time at European university centres.

Dr. E. W. Lunney, Saint John, has just returned after spending ten days in Boston and New York.

Dr. and Mrs. A. Pierce Crockett, of Fredericton, have returned from California.

Dr. Charles E. Dumont, of Campbellton, is doing post-graduate work in New York. The doctor's studies include general medicine and paediatrics.

Dr. L. P. Desy, Agent and Physician for the Indian Reserve of Restigouche, is reported to be seriously ill.

His friends in New Brunswick were sorry to learn of the rather severe injuries sustained by Dr. Murray

Dr. W. T. Purdy, of Amherst, was seriously ill in Montreal in April and May. He was doing x-ray work when stricken with appendicitis, was operated upon, and had a stormy convalescence. He is not yet able to resume his work fully.

Recent Militia Orders note the promotion of Dr. W. A. Curry, Major, C.A.M.C., to be Lieutenant-Colonel, and to command No. One Casualty Clearing Station, located at Halifax, vice Lieutenant-Colonel F. V. Woodbury, who has been transferred to and been appointed to command Number One (Reserve) Casualty Clearing Station, C.A.M.C.

Dr. H. K. MacDonald, of Halifax, was elected Honorary President of the Nova Scotia Liberal-Conservative Association at the recent annual meeting. Dr. MacDonald has been president of this association for several years.

MacLaren. The accident happened in Ottawa where Dr. MacLaren was engaged in his parliamentary duties.

Dr. L. G. Pinault, of Campbellton, has been elected President of the local Rotary Club for the ensuing year.

Dr. L. E. German, of Campbellton, was unfortunate enough this month to lose his house and all its contents by fire.

The extra-mural lecturers in New Brunswick for April were Dr. W. P. Kirby and Dr. A. Raymond Landry of Moncton. Owing to some disorganization, due to the condition of the spring roads, these gentlemen spoke only at Moncton and Saint John. They dealt with gall bladder and hepatic diseases, as a team, Dr. Kirby speaking on the surgical aspect, and Dr. Landry on the medical and physiological conditions.

Dr. Landry's address was of particular interest, inasmuch as he was able to quote and discuss a large number of French authorities, access to whose works is not common among the English speaking physicians.

Dr. Kirby's address was entirely practical, and illustrated by examples from his own experience.

This is the second team of local physicians to appear under extra-mural auspices, and again the appreciation expressed must have been very gratifying to the physicians providing the paper.

A. STANLEY KIRKLAND

QUEBEC

The little town of Kenogami, in northern Quebec, led the province in infantile mortality for the month of February last, according to vital statistics, issued this morning, for that month. Its percentage was 384.5 per 1,000, but it was not very much ahead of Lévis, which had 333.3, and of Sorel which had 315.8. The total provincial infantile-mortality average for the month amounted to 126.3 while the average death-rate, for all ages, was only 12.4. During the course of the month there occurred 6,051 births, for an average 27.4; 764 deaths between the ages of 0 and 1 year, or an average of 126.3; 2,730 deaths in all, or an average of 12.4; and 1,025 marriages, or an average of 4.6.

An increase in the numbers of births, marriages and still-births, and a marked decrease in the number of deaths of all ages, including infant deaths, is reported in a preliminary report for the twelve months

of 1927. 17,874 marriages were celebrated in 1926, and 18,643 last year, the percentage being 7.0 and 7.2 respectively. Deaths of all ages numbered 37,292 in 1926, a percentage of 14.5; while last year they numbered 36,701 or 14.1 per cent. Cases of infantile mortality during 1926, this meaning deaths of children under one year of age, numbered 11,666, or 142 per cent, whilst last year they numbered 10,658, or 127.8 per cent.

A net deficit of \$157,122 was reported at the 106th annual meeting of the Montreal General Hospital. Lieut.-Col. Herbert Molson, the President, recalled the assurances received from the Provincial Government at the time of the Joint Hospitals' Campaign which was held last year, that, if the fund was raised by the citizens, the Government would assist substantially in

future in defraying the deficits. Col. Molson expressed the hope that the promised assistance would not be long delayed, as on the government action will depend entirely the possibility of extensions badly needed for the present time and for the future. Col. Molson regretted that the commission appointed by the city to study the hospital situation had tabled its report, but that nothing tangible had resulted, so far as relief for the hospitals was concerned.

J. T. McCall, Treasurer of the Board, reported that the net deficit for 1927 was \$157,122, which had been deducted from the capital account of the hospital. He explained that the \$26,000 increase in the deficit over 1926 was due in part to the increased cost of nursing and equipment during that period. He pointed out that the expenditure could not be reduced without making the Montreal General a second class hospital. The hospital is still popular, for it received \$54,000 from bequests last year. "We have a mortgage of \$320,000, which we would like to see cancelled. It would save us about \$18,000 a year interest. I would recommend that to any of our friends who have done exceptionally well during the past year," Mr McCall said. The generous bequest of \$100,000 from the late Sir Mortimer Davis also improved the financial situation.

The Notre Dame Hospital closed its year ending December 31, 1927, with a surplus of \$14,730, according to the Treasurer's report, presented at the annual meeting of the institution. Increases were also reported in the number of patients treated for the year and in the work of the dispensary. The ordinary receipts for the Notre Dame Hospital and St. Paul Pavilion amounted to \$361,458, and the operating expenses were \$395,994, so that there would have been a deficit of \$34,535, had it not been for public and private generosity. The average cost per patient per day was stated to be \$3.82, which would be greatly augmented, it was pointed out, were it not for the fact that the Grey Nuns gave their services without charge. Although it was not an uncommon sight to have a ward with patients representing fifteen different races and religions in at the same time, the majority of those treated were French-Canadian Catholics. No distinction is made in admitting patients, it was declared. The mortality rate at the Notre Dame was 6.6 per cent, and deducting those who died within forty-eight hours after admission, there was a net rate of 4.6 per cent. At St. Paul's the total rate was 9.7 per cent, and the net rate 5.3 per cent.

Stringent health regulations have been put into effect by the Board of Health of the Province of Quebec, especially as regards quarantine or incubation periods for contagious diseases, isolation, protection of educational institutions, disinfection, shrouding of dead bodies, contagious diseases in domestic animals (communicable to man), and penalties.

The by-laws state that the incubation period extends from the moment of infection to the appearance of the initial symptoms. The invasion and stationary

stage extends from the appearance of the initial symptoms to the beginning of convalescence. The convalescent stage extends from the disappearance of the fever to the complete recovery. For the purposes of the present by-laws, it is pointed out, the maximum duration of incubation periods is fixed. In case of a difference of opinion between the attending physician and the municipal sanitary authority, the latter's opinion shall prevail. The new by-laws do not restrict a municipality from using any supplementary measures they may desire to carry on in virtue of article 80 of the Quebec Public Health Act.

Any physician called to attend a patient showing certain symptoms, suggesting the possibility of a disease for which notification is required, shall report the case to the municipal sanitary authority. Whenever within the two weeks of a birth, the eyes of the new born child get red, swollen or inflamed, the person who has charge of said child shall without delay notify the family physician or, in his absence, the municipal sanitary authority. The latter shall then see that proper treatment be given to prevent blindness. Pneumonia is also dealt with, the by-laws stating that in case of open pulmonary tuberculosis the patient shall, as minimum isolation, have a bed to himself, and his sputa shall be collected to be burned or otherwise sterilized before it gets dry. He shall also be supplied with cutlery, linen and crockery, which shall be kept apart from others for his exclusive use. Moreover, such open-tuberculosis patient shall not occupy any position which shall bring him into contact with food or other eatables. Every case of ulcerated leprosy shall be isolated in a separate room until removed to a federal government lazaretto.

In connection with isolation, the by-laws state that all cases suspected of being contagious shall be kept isolated in a separate room for as long as, in the opinion of the municipal sanitary authority, the suspicion lasts. No domestic animals, (dogs, cats, birds) shall be allowed in the isolation room. All people infected with smallpox, Asiatic cholera, plague, typhus, diphtheria or croup, scarlet fever, epidemic influenza, measles, rubella, cerebro-spinal fever, meningitis, whooping-cough, mumps, chicken-pox, or erysipelas shall be isolated with their nurses in a separate room, if there is one, while nothing shall be taken out of such room without having been disinfected.

Three members of the staff of the medical faculty of McGill University were honoured at the recent Congress of Physicians and Surgeons at Washington when Prof. J. C. Meakins was elected President of the American Society of Clinical Investigation; Prof. Campbell Howard, President of the American Physicians, and Prof. A. Mackenzie Forbes, President of the American Society of Orthopaedic Surgeons.

Dr. Telesphore Parizeau, Director of Medical Studies at the University of Montreal, was elected President of the Cercle Universitaire, succeeding Dr. Edouard Montpetit, retiring. GEORGE HALL

ONTARIO

With April, the activities of the urban medical institutions wane, and examinations occupy the teaching staffs, to the exclusion of medical and clinical demonstrations.

The Academy meetings finished with the elections in mid-April, and until the fall only the business of the council will be transacted. It is felt by the officers of the Academy that the problem of new buildings and accommodation will have to be faced

in the near future, as the Ontario Government have signified their intention of taking the present site for office purposes. Reports of the various committees of the Academy indicate that the growth of the institution is being well maintained; the library is growing rapidly; the telephone exchange has been an unqualified success.

The Hamilton Medical Society met at St. Joseph's

Hospital on the evening of May 9th. A very comprehensive programme was put forth, consisting of case reports, which were in turn discussed by the staff and by visiting physicians who had been asked to be present. An unusually good attendance demonstrated the value of this method of instruction.

Dr. Barrington Nevitt, one of the best known of the older physicians in Canada, died in Toronto in his 78th year. The founder of the Women's Medical College, a teacher devoted to the imparting of the art of medicine, Dr. Nevitt leaves behind him a record of a life well spent. A description of his numerous activities will appear in a later issue. N. B. GWYN

On May 17th a dinner was tendered Professor Macleod at Hart House, Toronto. At that dinner were represented the University of Toronto and its various faculties, the Academy of Medicine, the Royal Canadian Institute, and prominent citizens of the City of Toronto. This afforded an opportunity to express appreciation of the distinguished services which have been rendered by him to the university, to science, and to the medical profession. His resignation means a tremendous loss not only to the University of Toronto, but to the development of scientific research in Canada. His departure will be most keenly felt by his colleagues and by the students in the Faculty of Medicine; they view the prospect of his withdrawal with the utmost concern and regret, not only because of his skill and resource

as a leader in the scientific laboratories and in the lecture theatre, but because of the close ties of personal friendship which have united him to his fellows.

A. PRIMROSE

The British Association of Dermatology and Syphilology—Canadian Branch—held its first annual meeting at Toronto, March 31, 1928. The following members were present: Dr. G. G. Campbell, Dr. F. G. Burgess and Dr. B. Usher, all of Montreal; Dr. Omar Wilson, of Ottawa; Dr. W. R. Jaffrey, of Hamilton; Dr. D. King Smith, Dr. H. A. Dixon, Dr. F. C. Harrison and Dr. E. J. Trow, all of Toronto.

Dr. D. King Smith, the President, was in the chair. The morning was devoted to a clinic at which thirty interesting cases were presented and freely discussed. In the afternoon the following papers were presented:

"Human sweat as a medium for the growth of organisms," Dr. B. Usher, Montreal; "Report of the active fraction principle in tar," Dr. W. R. Jaffrey, Hamilton; "Types of fungi grown from clinical cases," Dr. H. A. Dixon, Toronto; "Aplastic anaemia following salvarsan," Dr. E. J. Trow, Toronto.

Dr. Hugh MacKay, of Winnipeg, and Dr. D. E. H. Cleveland, of Vancouver, were elected members of the Association. Dr. Omar Wilson, of Ottawa, was elected President for the ensuing year, and Dr. E. J. Trow was re-elected Secretary.

The winter meeting will be held in Ottawa in December.

MANITOBA

The regular monthly meeting of the Winnipeg Medical Society was held on April 20th. Dr. B. J. Brandon presented a moving picture film, "Infections of the hand," prepared for the American College of Surgeons. Prof. J. C. B. Grant led the discussion. Dr. Ross Mitchell read a paper entitled "Medical amenities in the eighteenth century," reviewing the Hunter-Munro controversy.

A meeting of the Brandon and District Medical Association was held at Brandon Mental Hospital on April 30th. Twenty-nine physicians were present.

Dr. G. A. Davidson presented for diagnosis, a baby, nine months old, with marked obstruction to inspiration and a funnel-shaped depression over the sternum. Although it had been artificially fed, yet cod liver oil had been administered regularly, and there was no evidence of rickets. Dr. L. J. Carter suggested that the obstruction might be due to an enlarged thymus and recommended x-ray treatment. Dr. Ross Mitchell, of Winnipeg, gave an address on "Maternal mortality in Manitoba," and Dr. W. S. Peters, of Brandon, spoke on "Some difficulties of obstetrical practice." A resolution *re* Maternal mortality, introduced by Dr. C. A. Baragar, of Brandon, provoked an animated discussion, and, after amendment, was passed.

The Winnipeg Health League had a most successful exhibit in the Free Press Building, May 4th to 10th. The exhibit was formally opened by the Hon. Dr. E. W. Montgomery, Minister of Health. Addresses on such subjects as cancer, goitre, ante-natal care, mental hygiene, tuberculosis, diabetes, vaccines, pasteurization of milk, dental disease and instruction of youth were given by Drs. P. H. T. Thorlakson, May Bere, Marie Cameron, Fahrni, McQueen, Finkelstein, A. Hollenberg, A. McKenzie, C. J. Jackson, Alleyn, Mary Crawford, Harold Popham, Baragar, Kitchen, Rev. Dr. G. A. Woodside, and H. M. Speechly.

Drs. O. Bjornson, Professor of Obstetrics, A. P. MacKinnon, Demonstrator in Orthopaedic Surgery, and J. D. McEachern, Lecturer in Surgery, in the University of Manitoba, have returned from a tour of Alberta under the extra-mural post-graduate scheme which lasted from April 16th to April 27th. The places visited were Medicine Hat, Lethbridge, Calgary, Drumheller, Red Deer, Stettler, Edmonton and Vegreville and, the lecturers report very interesting meetings and good attendance. The subjects discussed were "Protracted Labour," "Better Obstetrics," "Low Back Pain," "Fractures and Dislocations of the Spine," "Abdominal Surgery in Children," and "Cholecystitis."

A statement issued by the Department of Health for Manitoba shows that in 1927 there were 68 maternal deaths and 14,033 live births, giving a maternal mortality rate of 4.8 per 1,000 live births. If three doubtful cases, concerning which additional information is sought from the attending physicians, are added, the rate will be 5.0 per 1,000 live births. The maternal deaths for 1924-25-26 were 90, 99, and 94 respectively.

Dr. Edward T. Thompson, a graduate of the University of Manitoba, and former resident of Winnipeg, has been appointed administrator of Indiana University Hospitals. He has been Assistant Superintendent of Ancker Hospital, St. Paul, for the last three years. In his new position he will superintend the operation of three hospitals connected with the University of Indiana Medical School. Dr. Thompson, who is twenty-eight years old, is one of the youngest physicians ever appointed to this office.

Alterations in the Victoria Hospital, Winnipeg, will allow for the addition of 15 beds, giving a total bed-capacity of 134.

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Miss Charlotte Whitton, Executive Secretary of the Canadian Council of Child Welfare, has accepted the invitation of the provincial government to conduct the investigation of child-welfare legislation in Manitoba. The investigation will not get under way until July.

Dr. F. G. McGuinness has been appointed Associate Obstetrician to the Winnipeg General Hospital.

Dr. Alexander Gibson of Winnipeg read a paper on "Polyarthritis with special reference to bacterio-

logy" before the American Orthopaedic Society at Washington on May 2nd.

Professor Chas. Hunter delivered an interesting address to the medical students on May 4th, on the occasion of the presentation of bronze medals and certificates of merit to those students obtaining 80 per cent or over of the term marks in the laboratory subjects.

Drs. W. Harvey Smith, Chas. McKenlie, O. S. Waugh, E. H. Alexander, and Digby Wheeler attended the meeting of the American Medical Association at Minneapolis. ROSS MITCHELL

SASKATCHEWAN

Drs. M. R. MacCharles and Harry D. Morse, both of Winnipeg, are making a tour through Saskatchewan under the extra-mural post-graduate scheme. Meetings are being held at Yorkton, Saskatoon, Rosetown, Prince Albert, North Battleford, Regina, Moose Jaw, Weyburn, and Swift Current, beginning on May 28th and ending June 7th. The papers are as follows: Dr. M. R. MacCharles: "A few experiences with malignant disease"; "Hematemesis." Dr. Harry D. Morse: "Chronic prostatitis—Its relation to anthraxis"; "The management of prostatic obstruction."

Dr. Scribner, who has been practising at Quill Lake, has moved to Sheho.

At a recent meeting of the Saskatoon District Medical Society, Dr. H. A. Matheson was appointed Secretary-Treasurer, in place of Dr. William Oliver who resigned.

Dr. H. E. Alexander, F.R.C.S., presented a case of intussusception, and gave a discussion on the various forms and also reported a second case. Dr. E. E. Shepley presented a case of naevus in a child and discussed the treatment. He also discussed the treatment of epithelioma of the face. Dr. Orr presented a case of diaphragmatic hernia in a child, showing radiographic plates. A full discussion arose on these most interesting cases.

At a later meeting, Dr. D. J. Ferguson presented a paper on "Oral sepsis in relation to systemic diseases." Dr. G. E. Dragan presented a case of Hodgkin's disease. Dr. Andrew Croll, F.R.C.S., gave a paper on "Congenital hemolytic and familial jaundice." Dr. H. E. Munroe, who has just returned from a trip to Hawaii, gave a very interesting account of medical conditions in that country, as well as general matters.

The Society was greatly interested in all the papers, as well as the discussion, and passed a motion of thanks to the speakers of the evening.

One hundred and fifty-four nurses from all parts of the province attended the annual convention of the Saskatchewan Registered Nurses held at Moose Jaw, on April 11th, 12th and 13th. Miss Jessie Grant, Superintendent of Nurses, Winnipeg General Hospital, spoke on the "History of Nursing," "The Curriculum in Schools of Nursing," and "Imagination as an Asset to the Nurse." Dr. R. McAllister, of Regina, gave three papers on "Maternal Care." Miss Dorothy Hopkins, of the Department of School Hygiene, read her essay on "Maternal Mortality," which won first prize in the competition sponsored by the Saskatchewan Registered Nurses. Miss L. E. Denton, former student at the Truby King Mothercraft Training School, at present Supervisor of a Red Cross Hospital at Nipawin, outlined recent work in "Mothercraft."

Dr. M. M. Seymour, Deputy Minister of Health, Saskatchewan, emphasized the fact that Saskatchewan has the lowest death rate in any part of the world where vital statistics are available. Dr. Gordon Young, of Moose Jaw, traced the history of blood transfusion from the seventeenth century to the present day. Miss Ruby Crealock, Dietitian, Grey Nun's Hospital, Regina, described the responsibilities of a Hospital Dietitian. Miss M. I. Hall, Victoria Hospital, Prince Albert, discussed the possibilities of a travelling dietitian. Miss C. S. Brown, Travelling Dietitian, told of her work.

The officers elected for 1928-29 are: President, Miss Ruby Simpson, Regina, Head of School Hygiene in the Department of Education; First Vice-President, Miss C. I. Stewart, Regina, Supervisor of the Red Cross Outposts of Saskatchewan; Second Vice-President, Sister Mary Raphael, Instructress of Nurses, Providence Hospital, Moose Jaw; Councillors, Miss S. A. Campbell, Superintendent of Nurses, Saskatoon City Hospital; Miss Sanderson, Superintendent of Nurses, Regina General Hospital.

The Convenors of Committees are: Private Duty: Miss Helen McCarthy, Regina; Public Health: Miss Jean McKenzie, Regina, Director of Saskatchewan Junior Red Cross; Nursing Education: Miss Hall, Superintendent of Nurses, Victoria Hospital, Prince Albert.

The delegates to the Canadian National Association Conference, which is being held in Winnipeg in July, are, Miss Ruby Simpson, Regina, and Miss Gullod, Maple Creek. The delegates to the Provincial Council of Women's Convention, in Saskatoon, April 20th, are Miss M. McGill, Miss Higginman and Miss S. A. Campbell.

Miss Elda M. Lyne, who for the past three years has been Secretary-Treasurer and Registrar for the Saskatchewan Registered Nurses Association, tendered her resignation.

The Association accepted the invitation of the City of Saskatoon and the Registered Nurses Association of that city to convene there next year.

Dr. M. M. Seymour, Deputy Minister of Health, and Dr. Covington, of the Rockefeller Foundation, recently met the Council of Gravelbourg. Mayor Coutu presided and explained that the meeting had been called to discuss the establishment of a full time Health Unit in memory of the late Father L. P. Gravel, the founder of the Town of Gravelbourg. Dr. Seymour, in addressing the meeting, said that he had planned to include nine municipalities in the new health district, as well as the Town of Gravelbourg and the Villages of La Flèche, Limerick, Woodrow, Kincaid, Hodgeville, Hazenmore, Mazenod, Coderre, Bateman, St. Boswells, Palmer and Shaunavon. The population of this district is 19,830 for the rural municipalities, and 4,057 for the

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towns and villages. The total assessment of the whole district is \$35,847,797.00. He estimated that the cost of administration will be approximately 30 cents per person or at the rate of one-fifth of one mill per person on the assessment.

Dr. Covington spoke of the benefits the people would derive from these health units.

The Provincial Council of Women, at their annual convention in Saskatoon, resolved that, owing to the

fact that no adequate provision is made for the treatment of mentally defective children, they would petition the Provincial Government to appoint a Commission to investigate the matter.

An order in Council has been passed whereby all employees in restaurants and cafés must present a medical certificate showing freedom from communicable disease. This certificate must be renewed every six months.

ALBERTA

The regular monthly meeting of the Edmonton Academy of Medicine, for March, was attended by more than ninety-five physicians, and was held in the Red Cross Hut of the University Hospital, preceded by an enjoyable supper served through the kindness of Dr. Washburn, Superintendent.

The scientific part of the programme took the form of a Clinical Pathological Conference on Pernicious Anemia, and all aspects of this disease were exhaustively and lucidly dealt with by Drs. Herber Jamieson, H. H. Hepburn, J. J. Ower, J. B. Collip and Egerton Pope, Miss Margaret Malone, Assistant Dietitian giving a demonstration of the methods of preparing liver.

At the conclusion of the meeting, Dr. J. B. Collip was the recipient of a presentation from the Academy, coupled with regrets that he was severing his connection with Alberta University in the near future to accept an appointment with McGill University, Montreal.

A special meeting of the Edmonton Academy of Medicine was held, March 14, 1928, in the Medical Building of the university for the purpose of presenting and discussing the main features of the Sterilization Bill recently enacted by the Legislative Assembly of Alberta.

Dr. M. R. Bow, Deputy Minister of Health, outlined some of the main points of the Bill, and cited numerous authorities in its support. Dr. Cooke, Superintendent of the Mental Hospital at Ponoka, spoke on the medical aspects of the Act and stated that the experience of other communities showed that sterilization of the feeble-minded had been of great value. The State of California was specially mentioned.

Dr. McAllister, Superintendent of the institution for feeble-minded at Red Deer gave it as his opinion that a certain percentage of high-grade morons could be dealt with to advantage eugenically.

Mr. J. J. Frawley, of the Attorney-General's Department, discussed the legal aspects of the Act and gave it as his opinion, in which he was supported by many prominent legal authorities, that any surgeon, who might perform this operation would be protected from civil action, but not from criminal responsibility until a test case had been made and decided by the Courts.

A committee of the Academy was appointed to consider this problem and report at a later date.

At the April meeting of the Academy the subject of discussion was the "Toxæmias of Pregnancy."

Dr. Brander opened the discussion, illustrating four of the types by case records. Dr. J. W. Scott took up the subject from the standpoint of "Blood Chemistry." Dr. L. C. Conn cited numerous statistics to indicate that conservative treatment had a lower mortality rate than operative treatment.

Dr. H. M. Tory, President of Alberta University, has resigned to take the position of President of the National Research Council of Canada. Much regret is being generally expressed at his leaving Edmonton,

where he has filled the position of President of the University since its inception. To his energy and executive ability the high standing of the University of Alberta as an institution of learning is largely due.

F. H. WHITEHEAD

The first of this year's extra-mural post-graduate courses was given between April 16th and 27th under the auspices of the Canadian Medical Association. Representatives from the University of Manitoba gave lectures and clinics at Medicine Hat, Lethbridge, Calgary, Drumheller, Red Deer, Stettler and Edmonton, which were largely attended. The instruction given was of a high quality of excellence and of much practical benefit to all who attended.

In Calgary clinics and lectures were given on the morning of April 19th at the General Hospital by Dr. H. P. McKinnon, Demonstrator in Orthopaedic Surgery, Manitoba University, on the subject of fractures of the spine, and by Dr. J. D. McEachern, Lecturer in Surgery, Manitoba University, on the diagnosis and treatment of exophthalmic goitre. In the evening, lectures were given by Dr. O. Bjornson, Professor of Obstetrics, Manitoba University, on indications for the use of forceps. Dr. J. D. McEachern spoke concerning the diagnosis of abdominal lesions in children, and discussed intussusception, megacolon, embryoma, sarcoma of the kidney, subphrenic abscess, pneumococcal peritonitis and streptococcal peritonitis.

The report of the Provincial Sanitarium for tuberculous patients at Keith shows that the accommodation has been taxed to the full extent. The average patient day strength has been 178, as compared with 165 in 1926. Further staff and equipment are required for any further increase in the number of patients. There have been 291 patient who have come for examination to the outdoor department, in addition to those who have entered the institution. During the last half of the year, through the co-operation of the Provincial Tuberculosis Association, a follow-up department has been in operation and examinations have been made on 190 persons.

The public health statistics for the year 1927 in the Province of Alberta show that there were 15,000 births. The death rate from all causes among the population was in the neighbourhood of 9 per thousand, there having been nearly 5,200 deaths. There were 353 reported cases of acute anterior poliomyelitis, as compared to 2 cases in 1926.

Dr. Robert Elder, who formerly practised at Granby, Quebec, and until recently at Macleod, Alberta, has opened an office in Calgary.

Dr. A. L. McRae, formerly of Clyde, who has been taking post-graduate work in industrial surgery at Morristown, New Jersey, has returned to Alberta to practise.

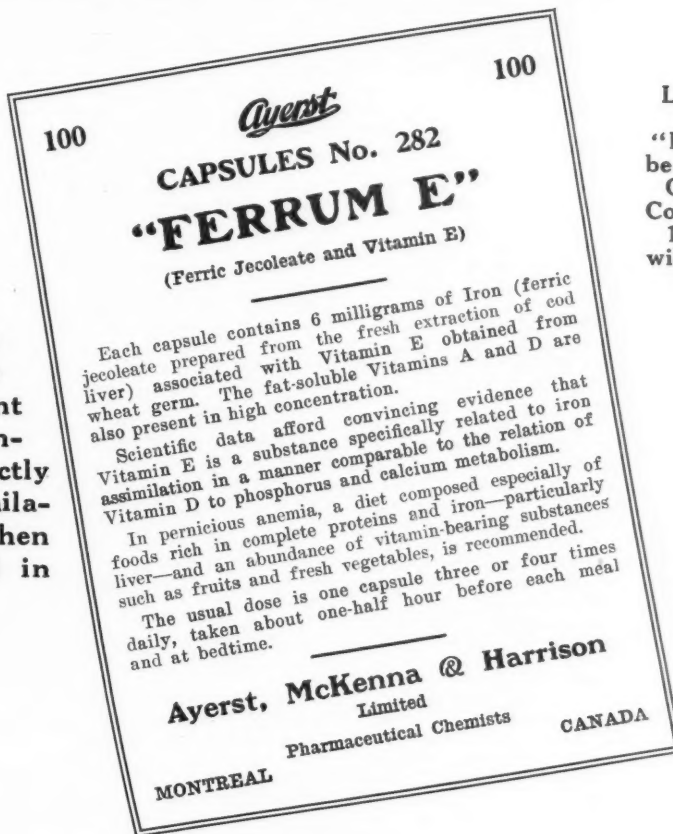
Dr. W. J. Siemans, who practised in Calgary for a

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CANADA

number of years in eye, ear, nose and throat work, is now in practice at Seattle.

Dr. P. L. Backus, of Red Deer, has resumed practice, after an illness of several weeks.

Dr. J. Key is now acting locum tenens for Dr. Shillabeer of Wetaskiwin.

Dr. H. O. Wilson, of Phoenix, Alta., has gone to California for a six months' sojourn, hoping that the change will restore his health.

Dr. H. B. Honey, who has been relieving Dr. Henderson during his illness, is now at Coalhurst, looking after Dr. W. W. Inkrote's practice while he is in the east.
G. E. LEARMONTH

BRITISH COLUMBIA

The regular monthly meeting of the Vancouver Medical Association was held on April 3rd, the President, Dr. Schimbein, occupying the chair. Forty members were present.

Drs. A. M. Agnew, E. E. Day, C. T. McCallum, H. R. Mustard, D. M. Meekison, J. E. Walker, W. H. Hatfield, and W. L. Graham were nominated for membership.

Dr. J. W. Arbuckle presented the report of the Committee *re* co-operation between the British Columbia and Vancouver Medical Associations, and moved that it be received.

Drs. J. E. Campbell and R. C. Weldon were nominated by the Association for the vacant post of Urologist on the Vancouver General Hospital staff.

Dr. J. A. Gillespie brought up the question of Health Insurance, and, in view of the likelihood of legislation in the near future, moved the following resolution: "That the Vancouver Medical Association request the British Columbia Medical Association to appoint a committee to consider the question of Health Insurance and to safeguard the interests of the medical profession in this regard." This motion was duly seconded and carried unanimously.

The speaker of the evening was Dr. F. Epplen, of Seattle, Wash., who addressed the Association on some of the newer methods of diagnosis in renal disease.

It is gratifying to note that through the efforts of the British Columbia Medical Association, the British Columbia Coroners' Act has been amended to provide for better remuneration to coroners, medical witnesses, for mileage, and also for autopsy and serological work. The Attorney-General has now authority to increase the present schedule of fees in special circumstances at his discretion.

At a luncheon held on April 19th by the Victoria Medical Society at the Empress Hotel, Victoria, Dr. Thomas McPherson read an address on the life and works of John Hunter. The collection of anatomical and pathological specimens in the British Medical Association Museum, known as the Hunterian Collection, was gathered together by the man whose bi-centenary the members of the Victoria Medical Society chose to honour. Dr. Forest Leeder, in a happy manner, proposed a vote of thanks to Dr. McPherson for his

interesting address. About thirty-five members were present. It is the intention of the society to have similar gatherings to honour the memory of men who have contributed to medical science.

At a meeting of the Fraser Valley Medical Society held on April 24th, Dr. R. E. McKechnie of Vancouver, addressed the Society on "Surgery of the Bladder." The attendance was exceptionally good and the speaker was thanked for his interesting address.

Mr. C. J. Fletcher, Executive-Secretary of the British Columbia Medical Association has just completed an intensive tour of the interior of British Columbia. He interviewed all the members in the Okanagan and Kootenay districts and reports 100 per cent collections of dues. Many matters of an economic nature were discussed and a number of difficulties of individual men straightened out. In particular several grievances against the government and Indian Department have been adjusted. It is only fair to state that most of these were owing to misunderstandings.

We deeply regret to record the death, on May 2nd, of Dr. Howard Miller of Victoria. Dr. Miller was a valued member of the British Columbia Medical Association and we extend to his wife and family our deepest sympathy. An obituary notice will be found elsewhere in this issue.

Dr. F. W. Andrew has resumed his practice at Summerland after some weeks spent in California convalescing after a severe illness.

Dr. A. Francis, late of Greenwood, B.C., is now at Hedley and Keremeos, B.C., having taken over the practice of the late Dr. M. D. McEwen.

Dr. W. J. Knox, of Kelowna, who has been recuperating from his recent long illness in Florida, has now returned to his practice.

Dr. Stuart T. Kenning the popular Honorary Secretary-Treasurer of the Victoria Medical Society is recovering rapidly at St. Joseph's Hospital from a recent operation.

J. EWART CAMPBELL

UNITED STATES

Infantile paralysis presents one of the most urgent and difficult problems in modern preventive medicine. Little has been discovered about its prevention and control, in spite of the immense amount of study which has been given to the problem. The death rate from acute poliomyelitis was higher in 1927 than in any year since the epidemic of 1916.

It is announced by Dr. William Park, of New York, that a concerted attack is to be made on this important disease. An international committee for the

study of infantile paralysis has been formed and the Universities of Chicago, Columbia, Harvard and New York in the United States, the University of Brussels, and the Lister Institute of London will participate. The committee hopes, as work progresses, to enlist the co-operation of still other institutions and laboratories in various countries. Each university and laboratory will have absolute freedom in carrying on its investigations; but the results, studied and co-ordinated by the committee, will represent a joint piece of work, each



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A splendid contribution of \$250,000 from Mr. Jeremiah Milbank of New York will finance the undertaking. Dr. William H. Park of New York University, and Director of the Bureau of Laboratories of the New York City Health Department, will be chairman of the committee. The headquarters will be at Dr. Park's office at the foot of East 16th Street, New York City.

The American College of Surgeons is carrying on a campaign to ensure proper medical care for persons injured by accidents. A research board, appointed by the College, after a two years' study of the question, report that the annual loss to industry on account of injuries to employees is \$1,250,000,000. Methods are suggested which, it is believed, will reduce this staggering sum by \$200,000,000. The report, further, reveals that a large number of accident cases are taken to poorly equipped hospitals, and cared for by sur-

geons who are incompetent, and in many cases unethical.

The New York State Psychiatric Institute and Hospital, costing about \$2,000,000, is about ready for occupation. It is a building twenty storeys in height, with two hundred beds. It forms part of the Columbia-Presbyterian Medical Centre of New York City, and overlooks Riverside Drive. Its primary object is to facilitate the study of the causes and treatment of mental diseases, and, therefore, only cases of special interest to science will be admitted.

Professor C. E. A. Winslow, Lauder Professor of Public Health at Yale University, has been awarded the Ling Medal by the Ling Foundation of Los Angeles, "in appreciation and recognition of Professor Winslow's active and unselfish work on behalf of the health progress of school children."

Book Reviews

Pathological Physiology of Internal Diseases. Albion Walter Hewlett, M.D., B.S. Revised by George DeForest Barnett, and others. 787 pages, 164 illustrations. D. Appleton & Co., New York, 1928.

Hewlett's book, which first appeared in 1916, was revised in 1923. The present third edition has been brought forward by his colleagues as a memorial to him. His own notes have been largely used, notes made in preparation for a new edition which he outlined shortly before his death in 1925. An attempt has been made to include the recent advances in clinical physiology.

The book deals with the changes in function which are presented by patients suffering from internal diseases. It is to be noted that in controversial subjects, or where opinion is divided, the author or his colleagues are inclined to express a definite opinion. This is often arbitrary, but the reader has a very full list of references given him by which means he may pursue the subject further, if so inclined. Metabolism and pathological chemistry have made such advances in recent years that such a volume must be welcomed by the physician who wishes to keep his knowledge up to date. The attempt to explain the symptoms of disease, where altered function is the cause, will be of service in affording a more rational basis for therapeutic measures.

J. H. ELLIOTT

Diabetes, and Its Treatment by Insulin and Diet. A Handbook for the Patient. Orlando H. Pettv, M.D. Fourth revised and enlarged edition. 152 pages. Price \$2.00. F. A. Davis Co., Philadelphia, 1928.

It is well recognized that for the successful management of diabetes the intelligent co-operation of the patient is essential. It is this fact that has prompted the publication, from time to time, of "manuals" for the patient. In these small hand-books the disease is described in language void, as much as possible, of technical terms. Excellent works by English, American and Canadian authors are now available, such as that of Lawrence in England, Joslin in the United States and Campbell and Porter in Canada, to name a few. It appears to the reviewer that there are only two valid reasons for increasing the number of such works, as far as the interest of the diabetic is concerned. The author either has something new to say or that which is known can be presented in a more clear and a less technical manner. If this view is correct the volume under review serves no useful purpose. Not only does it not contain new

information nor tell the story in a more simple manner, but, from its contents, it appears to be below the standard set by previous publications.

In the preface, it is stated that the book is not a scientific discussion of diabetes, but a statement of facts that have become a matter of common knowledge among physicians. This is incompatible with many discussions throughout the book, the matter of which is highly controversial.

As to simplifying the story of diabetes, one again fails to see the value of this addition to the literature. One can hardly expect the average layman to understand many of the subjects discussed without definition of the technical terms used. For example, in demonstrating the factors which regulate blood sugar, such terms as oxidation, glycogen, glycolysis, sympathetic nervous system, adrenalin and hormone are given without explanations.

In the discussion of the possible modes of formation of the different vitamins, a subject of questionable interest to the diabetic, an analogy is given of the formation of protein from ammonium nitrate. How the layman can possibly understand, without explanation, the relationship between ammonium nitrate and protein appears rather difficult to understand.

An æsthetic blemish in the book is repeated reference to the physician as "a real doctor, an M.D."

On the whole, the reviewer finds it difficult to recommend this book.

I. M. RABINOWITCH

Safeguarded Thyroidectomy and Thyroid Surgery.

Charles Conrad Miller, M.D. 261 pages, 52 illustrations. Price \$4.25. F. A. Davis Co., Philadelphia, 1928.

This manual is designed as a practical guide for the general surgeon. Dr. Miller describes his personal technique for "safeguarded" subtotal thyroidectomy. He feels that his method can be followed by surgeons of experience without undue risk to the patient, and in developing this idea he lays emphasis upon certain phases of diagnosis and treatment which, in his opinion, have been neglected or ignored by other writers.

The author considers that evidences of cardiac disorder are the earliest, most constant, and most important changes in thyroid disease. It is recommended that all thyrotoxic patients be treated by repeated digitalization. The most important part of pre-operative care is the building up of an adequate cardiac reserve power, and the pulse and blood

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pressure readings supply the most accurate indications of the patient's general condition.

While basal metabolic readings are useful, the author feels that there are frequently periods when they are deceptive. It is stated that severe thyroid disturbance can exist without a pronounced deviation of the basal metabolic rate from the normal, and that most importance should be attached to the pulse rate. Conversely, the statement is made that dyspnoea, occurring as a result of heart failure, may raise the metabolic rate as much as 20 per cent.

A detailed description is given of a technique for thyroidectomy, in which the goitre is mobilized by clamping and sharp dissection made of the periglandular tissues. The main arteries are not ligated, and no attempt is made to restore the capsule of the posterior disc of thyroid tissue which remains after amputation of the anterior portion. The isthmus is not removed.

The book contains interesting material for students of thyroid surgery, and general surgeons desiring information upon the author's personal technique will find it clearly set forth. Some of the chapters contain brief references to the literature.

R. R. FITZGERALD

Diseases of the Skin. Henry H. Hazen, A.M., M.D., Professor of Dermatology in the Medical Department of Georgetown University. Third edition. 572 pages, 248 illustrations. Price \$10.00. St. Louis, C. V. Mosby Co.; Canada, McAllister & Co., Toronto, 1927.

This is a moderate sized text-book, which, although it contains all the essentials of dermatology, is not intended to be an exhaustive treatise on the subject. It is written in a terse, lucid style, tinged somewhat with dogmatism, which should make it popular with students.

An unusual and interesting feature of the book is a paragraph at the end of some of the chapters, especially those dealing with the more common diseases, giving the author's experiences with the disease in negroes.

Histopathology is dealt with rather fully as it should be and constitutes one of the best features of the book.

HAROLD ORR

Anthelmintics and Their Uses. R. N. Chopra, Professor of Pharmacology, Calcutta School of Tropical Medicine and Hygiene, and A. C. Chandler, Professor of Biology, Rice Institute, Houston, Texas. 291 pages. Price \$5.00. The Williams and Wilkins Company, Baltimore, 1928.

This is a good book. It is well-arranged, well-balanced on the theoretical and practical sides, and gives one the feeling that the authors know what they are writing about. It is not an exhaustive treatise, but on the other hand contains enough to meet ordinary requirements. The book is divided into three sections dealing with, (1) General considerations; (2) Anthelmintics acting on parasites in the gut; and (3) Anthelmintics used against somatic parasitic infections. Section 2, which is the most important practically, excepting the discussion of tartar emetic in Bilharzia in Section 3, contains brief, but on the whole adequate, accounts of the history, source, chemistry, pharmacology, toxicology, and use of the most employed drugs, as well as brief accounts of the more obscure remedies. A bibliography of 22 pages is included.

R. L. STEHLE

Treatment by Manipulation. A. G. Timbrell Fisher, M.C., F.R.C.S. (Eng.). Second Edition. 200 pages, 62 illustrations. Price 9s. net. H. K. Lewis & Co. Ltd., London, 1928.

This work is introduced by an excellent chapter in the form of an historical review of treatment by

manipulation; then there is a brief chapter on the pathological conditions which are to be benefited by these methods. The remainder of the book is devoted to treatment; the first chapter dealing with the general underlying principles. This is followed by special applications and technical methods are described with numerous cases to illustrate the same. Beginning with the knee-joint, which calls forth an excellent chapter, he discusses methods and cites numerous cases affecting the various joints. The anatomical structures and the range of movement are carefully emphasized. Various affections of the spine are then discussed and various beneficial manoeuvres are described. A chapter follows on miscellaneous disabilities on which manipulative treatment can be performed. The author then emphasizes the necessity of an accurate diagnosis, and gives a note of warning about the dangers of misapplied manipulation, which shows his sincerity. This book is a valuable contribution and should be widely read and its methods applied. By such means many patients will be benefited and the improper notoriety of certain cults will be much restricted.

NORMAN BROWN

The Young Man and Medicine. Lewellys F. Barker, M.D., LL.D., Professor Emeritus of Medicine, Johns Hopkins University. 202 pages. New York: The Macmillan Co., 1928.

This book represents one of a group of "Vocational Series," having for its purpose to introduce students to the various ramifications and intricacies of medicine. The editor could not have chosen a more liberal, scientific and careful observer than Lewellys Barker, and it will be with a great deal of pleasure and gain of insight into the field of medicine that one will read this book. The author has approached the subject from a psychological angle, by which the success of this book reaches heights only comparable to the best of books of this type.

A good life in any organized group may be defined as one in which a high degree of realization of the self is associated with the greatest possible worthy service to society. In the practice of medicine this is easily accomplished. In entering this specialized life, one must remember that he is giving his mind and body over to society; that he is making a great sacrifice to humanity; that his time and energy will be consumed in the pursuit of knowledge and research; and in return he shall receive rewards which will bountifully repay him. He will receive the admiration of the social group; he will be a leader in his community; he will receive a modest living and invest about himself the best minds of the community.

No student or physician should fail to read this book; no teacher can afford to lose the contents of this masterly stroke. It deals with the decision regarding a life-career; the services rendered by the physician in a social organization; the personal rewards and satisfactions of medical workers. The appendix contains much interesting data.

A. W. YOUNG

Convalescence, Historical and Practical. John Bryant, M.D. 300 pages, 104 illustrations. Price \$5.00. The Sturgis Fund of the Burke Foundation, White Plains, N.Y., 1927.

During the years 1922-26 Dr. Bryant contributed some eleven articles to the *Boston Medical and Surgical Journal* upon the subject of convalescence. These collected and amplified form the present book. As compared with the original reprints, numerous corrections and additions will be noted in the text. Also, there have been added photographs and plans of some of the more important existing and proposed convalescent institutions both here and abroad, on the ancient Chinese principle that one illustration is worth ten thousand words.

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Four of the chapters present a historical review of the literature of the subject, divided into periods, and these include descriptions of some earlier attempts to develop convalescent homes. The work of the Burke Relief Foundation at White Plains, N.Y., with its 300 convalescent beds opened in 1915, is described in a separate chapter. The Cleveland Hospital and Health Survey Report of 1920 is discussed in another chapter. One deals with Houses of Rest in Russia; three with Convalescent Work in the U.S. Army; and one is on surgical convalescence. Questions of staff, equipment, and hospital routine are discussed. There has been need for a book dealing with the institutional care of the convalescent. Most of our hospitals find that an undue proportion of their beds are occupied by patients no longer acutely ill, but as yet unfit for work, and who are unable to secure home care or adequate home care. More convalescent beds would serve to lessen hospital congestion and secure more prompt admissions in many cases.

J. H. ELLIOTT

The Manual of Industrial Safety. Sidney J. Williams. A. W. Shaw Co., Chicago and New York, 1927, viii, 207 pp.

The author of this book is the Director of the Public Safety Division of the National Safety Council, and has been actively engaged for many years in safety work. His statements may be accepted as authoritative therefore. Ten of the twenty chapters are devoted to its question of organization, for the author enunciates the principle in the preface that "Accident prevention is at bottom and in the main a problem of organization and education." In these first ten chapters plant-safety committees, safety meetings, publicity, campaigns, and records are discussed in a manner which makes one believe that the author knows what he is talking about. The chapters are full of practical suggestions which can hardly fail to be of value to the tyro, though some of them are almost too obvious to require mention. For example, it seems unnecessary to advise against making foolish suggestions to foremen. Certainly many foolish suggestions are made, but never consciously, surely!

The subject is everywhere considered in the practical, rather than in the academic, manner, and so there is very little consideration of such things as fatigue, ventilation, mental states, night work, and the like, in their relation to accidents. These are the factors which English authorities have been inclined to emphasize. However, it is the opinion of the reviewer that the author is right in laying great stress on organization, and in emphasizing the fact that safety is not the function of the safety man alone but of everyone in the plant.

The references in the book are almost entirely to American authorities, but they are numerous and otherwise complete. They are designed to fill in the details while the author outlines the subject in a general way. These references supplement the book very well. The most sketchy treatment is that of Health and Sanitation, and in this particular chapter the references are very meagre and somewhat out of date.

At the end of the book there are three appendices, Appendix A. details the accomplishments of certain plants in the reduction of accidents; appendix B. lists the Safety Codes of the American Engineering Standards Committee of New York and the Safe Practices Pamphlets of the National Safety Council; in appendix C. the hazards of special industries are listed.

FRANK G. PEDLEY

The Embryology of the Pig. Bradley M. Patten. Philadelphia, P. Blakiston's Son & Co., 1927. \$3.50.

This book is delightfully written, and cannot help

but induce the student to become an "active acquirer" of embryological knowledge, rather than a mere "passive recipient." In it one can easily follow the metamorphosis of the pig from the microcosm of the fertilized ovum through progressively more complicated stages to the adult condition. The story of development is essentially the same in all mammals, and the pig serves admirably as a vehicle for the conveyance of this story, because its material is readily available, and because a large literature has already grown up around it.

The author has conscripted all the most recent contributions to his subject, and, as well as the results of his own researches, there are to be found the illuminating recent discoveries made in the Carnegie Laboratory in Baltimore, particularly by Streeter and Heuser. Very interesting is the account of the earlier development of the pig, in which a complete series of cleavage stages has been obtained. Thus a region is traversed which, as yet, is utterly unknown in the human subject. The peculiar blastocysts of enormous length are described.

Yet this is no mere encyclopedia of the development of the pig; rather it is a manual built up primarily to aid the student of mammalian structure and function. Its strongest feature is the graphic physiological interpretation of the ontogenetic process. The special conditions of the embryo are set forth, and the means adapted for meeting these conditions are given, as in the treatment of the circulatory system. The main blood currents, it is shown, are concentrated at the centres of greatest activity. Again, since the lungs cannot function in the "amniotic aquarium," some other organ must do duty in gaseous interchange, and so we have the placenta developed, which is a temporary lung, as well as a kidney and alimentary system. Examples of organ and tissue preparedness for the assumption of post-natal functions are given. Recent work in endocrinology is presented, such as that of Allan on the follicular hormone.

The 10-mm. stage of the pig is well discussed, but one misses a thorough description of an earlier period, such as that of 5 or 6 mm.

The service of embryology, says the author, "lies in the rational interpretation of other subjects," and when one tries to appraise the debt which anatomy alone owes to embryology, one welcomes any book which makes a knowledge of development easier of acquisition, more definite and more complete.

CHAS. C. MACKLIN

Handbook on Diet. Eugene E. Marcovici, M.D. 323 pages. Price \$4.00. F. A. Davis Co., Philadelphia, 1928.

Written by a former assistant of Von Noorden, and now attached to the Post-Graduate and Roosevelt Hospitals in New York, this moderate-sized book reflects much of the Vienna school of thought. For instance, much is made of European mineral waters and wines which might be difficult to procure in the U.S.A., while caviare can hardly be said to be "used often in the diet of the sick" on this continent.

It is disappointing to find that the subject of vitamins is most incompletely treated, while a discussion on tobacco occupies three whole pages. Half the space allotted to stomatitis is occupied by a long prescription for a mouth wash. Various discrepancies are noted. For instance, on page 204, the salt content of 100 gm. of rice is given as 1.04 gm., and on page 208 as 0.009 gm. It might be better to stick to one way of spelling "Karel" and not vary it to "Carrell" in places. Banana is not mentioned in the treatment of sprue though strawberries are especially recommended.

Two statements are made which are at variance with modern physiology and are relics of the last century. The first, on page 17, states that "practically all the different varieties of proteins, whether of animal or

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vegetable origin, have the same or almost the same nutritive value." Again, on page 132 it is stated that "for rectal feeding employ milk and dextrose, soft boiled eggs, wine, pepsin, pancreas powder or meat pancreas enema."

Finally, in speaking of gout on page 173, the author says: "we advise a more restricted diet over a long period of time so that the fermentative apparatus of the nuclein metabolism may have a chance to recover." This statement is somewhat difficult of comprehension.

On the whole one feels that the book is not suitable for use on this continent, although there are many excellent parts which would repay a careful perusal.

L. M. LINDSAY

Strabismus, Its Etiology and Treatment. Oscar Wilkinson, A.M., M.D., D.Sc., Surgeon in Chief of Washington Eye and Ear Hospital, Washington, D.C.; 240 pages, illustrated. Price \$10.00. The C. V. Mosby Company, St. Louis; McAllister & Co., Toronto.

This book has been written in the interest of the cross-eyed child, and the aim of writer, as stated in the preface, is to impress upon the public, the general practitioner, and the oculist, the importance of early definite treatment of these cases, and to warn them of the evil that "watchful waiting" brings to this afflicted class.

There are twelve chapters and an index, the arrangement of which covers the subject in a logical way. The book is well written, in good clear type, and the illustrations which number one hundred and twenty are excellent; twelve of these are coloured.

Of the chapters—the historical remarks of the first chapter are not the least interesting. In the second

chapter etiology is discussed. The muscular, accommodation, and fusion theories are explained, and to these the author adds a fourth, which he calls the nervous theory, and for which he claims no originality. He feels justified in introducing it on account of the great amount of literature on the nervous control or want of control in squint. Following these theories he mentions and briefly describes the contributory causes. The remaining chapters are in the following order: Anatomy of the orbit and ocular muscles; Physiology of the muscles of the eye; Physiology of vision; Types of strabismus; Measurements of strabismus; Paralytic strabismus; The examination of a case of strabismus; Non-operative treatment of strabismus; Operative treatment of strabismus; and, finally, Illustrative cases.

On the operative side the author describes the numerous methods of procedure: tenotomy, advancement, resection, tucking, and recession. The technique of the various operations is given, and finally the procedure which he has found most successful is described. He favours resection with recession if necessary, but both to be done by accurate measurements, for which he has devised special measuring instruments. He emphasizes the risks of tenotomy of the lateral muscle, and only favours its use in divergent strabismus due to divergent excess.

An outstanding feature of the book is the bibliography at the end of each chapter, which conveys some idea of the amount of work necessary in its compilation.

The author deserves the greatest praise for his labours in giving to ophthalmology a book which is almost a necessity to all those practising that specialty.

J. A. MACMILLAN

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